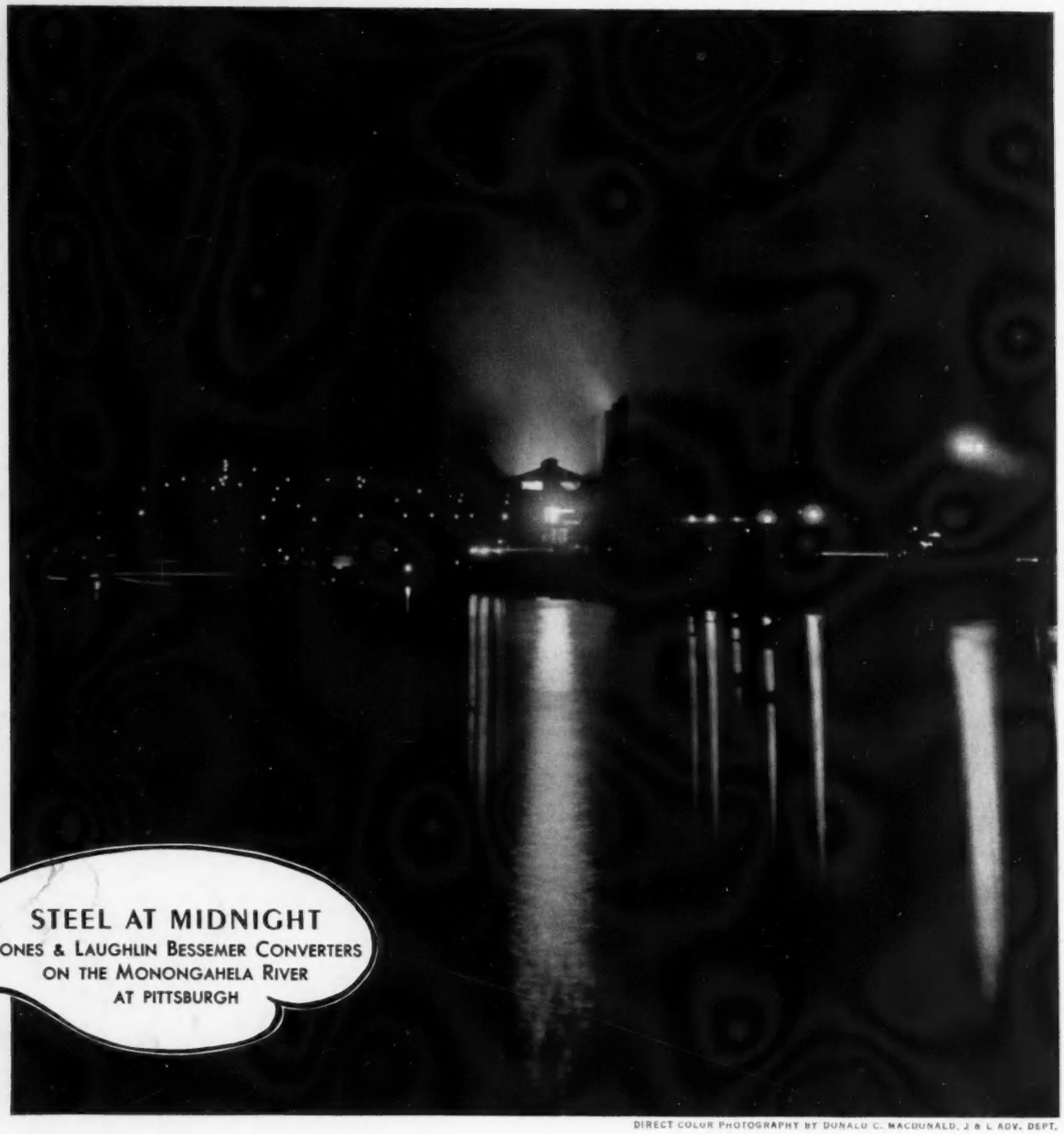
S·A·E Journal

MAY 1940

THE SOCIETY OF AUTOMOTIVE ENGINEERS ·



STEEL AT MIDNIGHT
JONES & LAUGHLIN BESSEMER CONVERTERS
ON THE MONONGAHELA RIVER
AT PITTSBURGH

DIRECT COLOR PHOTOGRAPHY BY DONALD C. MACDONALD, J & L ADV. DEPT.

YOUR AUTOMATIC MACHINES ARE WORTH MORE TODAY

How? Well, with the new, uniform free-cutting qualities of J&L Bessemer Flame Control* Cold Finished Screw Steel, hundreds of automatic screw machines in shops throughout the country are producing better steel parts, and at a faster rate. Therefore, improved and increased production with no added equipment. Manufacturers now using this revolutionary steel are enjoying very substantial production increases. Proof? See your J&L salesman this week. He has the facts it will pay you to know...or let us mail these facts to you.

**Bessemer Flame Control is one of several methods on which patent applications have been filed by Jones & Laughlin Steel Corporation*

J&L
Hot & Cold Rolled
Sheet & Strip
Forging Steel
Jalcase Steel
Cold Heading
& Spring Wire

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS
JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA

J&L STEEL

S·A·E JOURNAL

Published Monthly By The Society of Automotive Engineers, Inc.

Arthur Nutt, President — David Beecroft, Treasurer

John A. C. Warner, Secretary and General Manager

Norman G. Shidle, Executive Editor

Vol. 46 — MAY, 1940 — No. 5

CONTENTS

About Authors

● George W. Brady *started in the aviation industry 14 years ago when he halted his studies at M.I.T. for six months to work with the Glenn L. Martin Co. He had previously graduated from Yale, and after returning to M.I.T. received his M.S. degree in 1927. He worked for the Chance Vought as project engineer, American Airways as division engineer and the Warrior Engineering Co. as design engineer, before joining Curtiss-Wright's Propeller Division in 1935. He has been chief engineer of the division since 1937. His work in propellers includes structural and detail design work, aerodynamic investigations and development of feathering circuits and constant-speed controls. He was one of the first passengers to fly in a ship equipped with constant-speed feathering propellers.*

● E. H. Dix, Jr., *(M '39), since 1923 has been affiliated with the Aluminum Research Laboratories, first as metallurgist in charge of the New Kensington Metallurgical Division and, since 1930, as chief metallurgist. Active in CFR work, he is director of the corrosion projects of its Aviation Fuels Division. Graduating from Cornell University with Class of '14, Mr. Dix spent the next two years at the University instructing in engineering materials and materials testing. Then came an opportunity to do metallographic research work at the Morse Chain Works in Ithaca, followed by increasingly important assignments with the Baltimore Copper Smelting & Rolling Co., the United States Army Bureau of Aircraft Production and the Aluminum Castings Co. For three years before joining the Aluminum Research Laboratories, Mr. Dix was chief of the metals branch, Material Section, United States Air Service, in Dayton, Ohio.*

● Dr. Gordon M. Kline, *who has been research chemist, National Bureau of Standards from 1929, and chief of its Organic Plastics Section since it was organized in 1935, also has been technical editor of the publication, "Modern Plastics," from 1936 to date. After receiving his A.B. degree from Colgate University in 1925,*

(Concluded on page 34)

Publication Office, 56th and Chestnut Sts., Philadelphia, Pa.; Editorial and Advertising Departments at the headquarters of the Society, 29 West 39th St., New York, N. Y. Western Advertising Office, Room 2-136 General Motors Bldg., Detroit, Mich.

SAE Vice-President Gavin W. Laurie, Atlantic Refining Co. (right), declares the National Transportation and Maintenance Meeting officially open. Leaders in the opening round-table discussion session seated on the platform are: (left to right), Session Chairman J. Y. Ray, Virginia Electric & Power Co.; John M. Orr, Equitable Auto Co.; John R. North, Commonwealth & Southern Corp.; F. K. Glynn, American Telephone & Telegraph Co.; M. C. Horine, Mack Mfg. Corp.; F. L. Faulkner, Armour & Co.; O. A. Axelson, Columbia Engineering Corp.; and Henry Jennings, "Commercial Car Journal" (Photographs by Arthur T. Spohn, courtesy Gulf Oil Corp.)

Fact-Laden Fleet Debates Fill National Transportation Meeting

NEARLY 300 transportation and maintenance men, including supervisors of a majority of the biggest fleet operations in the country, were in Pittsburgh to participate in the two-day debate over current fleet problems which took place at the SAE National Transportation and Maintenance Meeting and Public Utility Fleet Supervisors Conference on March 28 and 29. Fact-laden arguments flew steadily back and forth through every technical session, resulting in high information quotients even when the interchange on a particular topic ended in what could best be described as a no-decision bout.

The elements of the truck capacity rating problem were much clarified in one session, though little new light was cast on just how the problem itself can best be resolved; pentrating question and vigorous answer featured an argument about the value or lack of value of compulsory motor-vehicle inspection; the soundness of motor-vehicle design in regard to most effective fuel utilization was sharply questioned by one fuel expert; the perennial differences about the relative merits of fleet-operated and outside dealer service for fleet vehicles got another thorough airing; and a score of other vital operating and maintenance topics were discussed. (Friday afternoon was held the Public Utilities Automotive Supervisors Conference under the chairmanship of J. R. North, Commonwealth & Southern Corp. The session was closed to outsiders and reports of its discussions not made public.)

Held under the auspices of the SAE National Transportation and Maintenance Activity Committee, local arrangements for the highly successful two-day meeting were handled by a Pittsburgh Section Committee of which SAE Past-Vice-President John M. Orr was general chairman. Other members of the local committee included B. H. Eaton, Murray Fahnestock, F. E. Haller, J. S. Harper, C. J. Livingstone, J. J. McNally and Pittsburgh Section Chairman R. M. Welker.

Truck Rating Leads Debates at Symposium

The fireworks began promptly at the "Information Please" session which followed immediately after the meeting had been officially opened on Thursday morning by SAE Vice-President Gavin W. Laurie. The session brought at least as many questions as answers—maybe more. Participation by the leading figures in the automotive transportation and maintenance field, however, developed fresh information and authoritative ideas on four intensely controversial fleet problems: (1) Uniformity in capacity rating for trucks: (2) Need for a truly economical passenger car for fleets: (3) Maintenance control for scattered and centrally located fleets: and (4) Inaccessibility of modern car and truck designs from a service standpoint.

Chairman of the session was J. Y. Ray, Virginia Electric & Power Co., while the group of experts who led the discussions included: J. M. Orr, Equitable Auto Co.; F. L. Faulkner, Armour & Co.; J. R. North, Commonwealth and Southern Corp.; O. A. Axelson, Columbia Engineering Corp.; F. K. Glynn, American Telephone & Telegraph Co.; Henry Jennings, *Commercial Car Journal*, and M. C. Horine, Mack Mfg. Co.

Prefacing the symposium, Chairman Ray indicated that perhaps the time had come for fleet operators to stop taking cracks at manufacturers and put their own houses in order. "Some fleet repair shops," he said, "look more like a truck assembly line than a place for maintenance of motor vehicles—and there are plenty of hammers and chisels in evidence to remind us of the good old days. . . . Many are still using the slap-happy practice of waiting for the vehicle to

fall apart before spending money for maintenance. . . . To these operators, a preventive maintenance program is just a new fangled theory surrounded by a lot of unnecessary expense."

A recent survey conducted by Mr. Orr, however, indicated to Mr. Ray that many problems still exist which point a finger right back at the manufacturer. One of these is the question of uniform truck capacity ratings.

The overwhelming difficulty of setting up a uniform truck capacity rating which would meet the requirements of licensing, of buying and of operating, was made clear by several speakers. F. B. Lautzenhiser, International Harvester Co., first propounded the dilemma. Then Mr. Horine emphasized the cleavage still further when he cited the possibility of rating a given vehicle at either 2½-ton or 6-ton and pointed to the vast difference in taxes which would be paid in various states. In some states, he showed the tax would be the same regardless of the rating; in others the 6-ton rating would result in a tax ten times that of the 2½-ton rating.

Opening the truck-rating discussion, Mr. Faulkner stressed the vital need for some uniform measuring stick by which competitive trucks could be rated from a buyer's standpoint, even though all experienced operators already have some system of their own for evaluating various parts and specifications. "Absolutely necessary," he called some sort of rating of highly stressed parts so that they can be matched on products of different makes.

Mr. Faulkner thinks that buying, not licensing requirements, should be the objective of uniform rating, and Mr. North agreed with this view saying that the buyer does want to know "what the truck will do." Other speakers disagreed, however, stressing the thought that the licensing factor is there as a fact and cannot be dodged.

Mr. Orr feels that the fleet purchaser can already buy intelligently because he can obtain all possible detailed information and specifications about various units on all trucks and that these data form an adequate basis upon which to make a selection. He questioned how many operators really have trouble selecting trucks which will give satisfactory service. E. W. Jahn, Consolidated Gas, Electric Light & Power Co. of Baltimore, took the same road when he expressed the opinion that the operator should work out his own specification needs thoroughly — and then he need not care how the manufacturer rates the truck. So far as the licensing requirements are concerned, Mr. Jahn said they are just like the weather. "We can talk a lot, but we can't do anything about them."

Mr. Axelson urged an entirely different approach to the problem when he suggested development of a yardstick for measuring vehicle efficiency. "The manufacturer of truck A says it will do certain things. The maker of truck B says it will do certain things. Why can't we develop a rating or factor to determine the ability of the particular vehicle to convert fuel into power," he asked, "a factor to determine the efficiency." Now we have no means of predetermining what a new type of vehicle will do, Mr. Axelson complained.

T. C. Smith, American Telephone & Telegraph Co., said he would agree with Mr. Axelson if we had never used trucks before. "But," Mr. Smith pointed out, "the experience which all fleet operators have had can and should help them materially in selection of parts and equipment when buying new trucks." Most operators do a good job of selection, in Mr. Smith's opinion, following three necessary steps: (1) narrow down the field to a few makes; (2) then pick out a few models of those makes to be considered and, finally, (3) have the fleet engineer pick those models to pieces in every detail to see that they will provide what is needed.

Mr. Glynn, as chairman of the SAE Truck Rating Committee, asked particularly for suggestions and discussions which might help his committee toward the most practical solution of their difficult problem.

C. J. Livingstone, Mellon Institute of Industrial Research (right), welcomes to the Institute's auditorium SAE Vice-President for Transportation and Maintenance Gavin W. Laurie (left), and T&M Meetings Committee Chairman J. Y. Ray (center)

Available Fleet Cars Praised

Current passenger cars available for fleet use apparently are filling the bill fairly well, if the consensus of opinion expressed in this symposium session is general among all fleet men. Mr. Axelson opened discussion of this subject by saying that the operators who criticize existing car models as being too flossy and too uneconomical for fleet use, probably would not buy the kind of car that would have to be designed to meet their current criticisms. The fleet operator cannot expect to get the comfort and performance that he requires coupled with 25 mpg and a $250 price. Mr. Axelson believes that fleet operators are getting their money's worth now.

Mr. Glynn indicated that some important automobile executives think the time is ripe for "re-shuffling the deck" and predicted that there might soon be a movement to put a smaller car back on the market. He agreed with the interpolation of W. L. Shaffner, General Motors Sales Corp., however, that such a car would have to be successful in the general market and could not be economically developed exclusively for the fleet buyer.

Both Mr. Ray and Mr. North emphasized their belief in the desirability of having a single make and a single model uniform through passenger-car fleets where the cars are pooled and used interchangeably by a number of men. This prevents kicks, they pointed out, as regards favoritism and saves much labor trouble. Both emphasized, too, the importance of having labor satisfied in this respect. Mr. North added his belief that the present low priced cars offer a wide range of selection to meet almost any needs.

Fred Heinlein, Cincinnati Gas & Electric Co., criticized the recent trend toward wider bodies, saying that it had increased accidents and reduced garage space about 20% so far as number of units is concerned.

Repairs – Inside or Out?

A comprehensive discussion of whether fleet maintenance can better be carried on in fleet-owned shops or through dealer or independent repair shop set-ups seemed to boil down to the inconclusive conclusion that: "It all depends on the circumstances in the individual case. Mr. North strongly favors doing work in fleet-owned garages, as does Mr. Ray, but Mr. North admitted that at least 15 cars had to be in a single group to make such an operation feasible. Mr. Axelson cited figures from his organization showing that maintenance on trucks under his supervision which had been maintained in company-owned shops averaged between $130 and $140 per car per year, while trucks serviced in dealer shops averaged between $63 and $75 per car per year. He emphasized, however, that he was not drawing any conclusions from those figures and that no other elements except cost were being discussed in relation to them.

Mr. Glynn said that the proper overhead rarely is allocated against labor in private fleet shops and that the man in the private shop will often go further than is necessary in making repairs.

Mr. Horine's statement on the subject came close to summarizing the general opinion when he said: "It all depends – on volume, on severity of service, and on availability of given facilities."

Accessibility Criticized

There seemed to be fairly general agreement that car and truck parts are less readily accessible for repairs than they were a number of years ago and that fleet operators would like to see improvement in this respect. Mr. Faulkner emphasized that there are many improvements which he believes can be made regardless of style requirements, although Mr. Horine emphasized the predominance of style demands in making accessibility more difficult to achieve. Greater accessibility, Mr. Horine urged, means greater complexity of design and greater complexity means greater cost.

Austin M. Wolf brought out the point that the rapid strides made in development of testing equipment and instrumentation has made it possible for the modern mechanic to do many jobs as quickly as before, despite less accessibility.

Henry Jennings quoted figures compiled from flat-rate schedules to show that the same service costs 25 to 33% more on 1939 cars than it did on 1930 cars.

200 Inspect Gulf Laboratories

Thursday afternoon saw nearly two hundred SAE members and guests packed into Mercury cars and whisked by police escort through Pittsburgh traffic out to the Harmarville Laboratories of the Gulf Research & Development Co., where a technical tour of the laboratories was preceded by a striking, though brief, talk on gasoline economy by R. J. S. Pigott, Gulf staff engineer in charge. Mr. Pigott spoke specifically and frankly about the factors which make for fuel economy, the relationships between design and fuel elements and ended by touching briefly on lubrication problems. Highlights of his talk are recorded on page 16.

McCance Speaks At Transport Dinner

Claiming that the public utility industry "is in the foreground in its application of motor-vehicle equipment to special tasks," P. H. McCance, vice-president, The Philadelphia Co., nevertheless questioned whether that industry is taking full advantage of these motor-vehicle tools in every respect when he appeared as the speaker of the evening at the Transportation Dinner on Thursday. John M. Orr, Equitable Auto Co., was toastmaster for the occasion. He was introduced by Dinner Chairman Murray Fahnestock, Ford Field Magazine.

Introduced by Toastmaster Orr for brief talks prior to Mr. McCance's address were SAE President Arthur Nutt, SAE Vice-President Gavin P. Laurie, SAE Secretary and General Manager John A. C. Warner, and Pittsburgh Section Chairman R. M. Welker.

Possibilities suggested by Mr. McCance for better use of motor vehicles included: (1) stimulation of the increased strides already being taken in vocational education to better equip boys with skills that will immediately fit in with the demands of automotive equipment work; (2) wider application of modern personnel procedures in selecting new personnel; (3) wider use of merit rating systems and (4) better training of personnel, particularly in relation to use of the vehicle while it is on the road.

Rating the job done by the fleet manager today as being "of exceptionally fine quality" and expressing the belief that "the cost for service is at the minimum so far as the present development of the art can make it," Mr. McCance went on to outline broader responsibilities for the fleet supervisor in connection with overall success of the organization of which he is a part.

"There is a constant survey and analysis to determine not how many vehicles can be operated for how many miles," he explained, "but how few vehicles are required to develop that balance of mileage at all times which will produce a satisfactory public service. . . . The bus, for example, is lower cost than a call-and-demand type of service – the taxicab, and the public recognizes that difference in cost in the price they are willing to pay for it.

"It is true," he concluded, "that the public utility industry has pioneered special tools in the automotive field as a labor and time saving

Prominent in Arrangement of T&M Meeting

Standing before a mural depicting the great Mellon Institute of Industrial Research where technical sessions were held are four men who played a large part in development of the program and arrangements. They are (left to right): Murray Fahnestock, SAE Councilor and a Past Chairman of the Pittsburgh Section; J. Y. Ray, Chairman of the T&M Activity Meetings Committee; R. M. Welker, Pittsburgh Section Chairman, and John M. Orr, Chairman of the Pittsburgh Section Committee in charge of local arrangements

device for the operator. The question, however, still remains as to whether efforts in that direction should not be reviewed and analyzed to see whether the demands placed on the fleet manager might not be modified to produce a lower overall cost for the service without sacrificing the efficiency of his most valuable tool."

Ga. Operator Talks On Fleet Economics

Nearly 200 were seated in the Mellon Institute Auditorium on Friday morning when B. H. Eaton, Bell Telephone of Pennsylvania, called to order the session at which Randolph Whitfield, Georgia Power Co., talked on "Some Economic Aspects of Utility Fleets."

Stating that in his company, the automotive expense is 80% as large as the electric transmission expense and 20% as large as the electric distribution expense, Mr. Whitfield showed that the automotive fleet has taken its place as a major item in public utility operation. "For every 9 hp our company has in electric generating plants," he said, "it has one hp on the engines of its cars and trucks." Seven out of every eight of these vehicles, he pointed out, are used for other than line crew work. The newer and wider uses, he showed, have come about because the motor vehicle has proved such an efficient tool that many new time and labor-saving uses have been found for it.

Emphasizing that the automobile is a tool, Mr. Whitfield went on to show that the true gage of its efficiency is not to be found in cost-per-mile figures, but in its total cost to the company for doing a given job that involves the use of automotive equipment. "There is no economy," he cited, "in having a $180-a-month engineer waste a third of his time, or $60 a month, catching rides with salesmen and line crews when he could be furnished a company car for a total actual cost of only $43 per month."

Sketching ways and means of increasing fleet economy without sacrificing company efficiency, Mr. Whitfield urged: (1) elimination of personal use and unnecessary business use of vehicles; (2) building up the use factor; (3) purchasing equipment having the lowest overall economy consistent with safety and sufficient comfort; (4) recognition of the economic point for vehicle replacement; (5) use of throttle stops; (6) maintenance of equipment by company-owned repair shops rather than by outside dealers; (7) preventive maintenance, and (8) a variety of other minor items including "lock caps on gas tanks so all the fuel will get to the carburetor."

Mr. Whitfield urged application of these principles in many specific ways. "Paint the vehicle red," he suggested, for instance, "because no one wants to take his date out in a car painted up like a fire truck, and if such a car were used on personal business the chances are it would be reported.

"Any inherent advantage of a particular make of car is multiplied," he urged, "if that make is used almost exclusively in the fleet," adding as a final piece of advice about purchasing:

"Always get competitive bids. Although it is decided that a certain make of vehicle is preferable, if bids are obtained from other dealers, and even in other towns, the concern whom you wish to favor can thus be kept in line. It pays occasionally to buy a make of car you do not want just to keep the others in line."

Mr. Whitfield claimed a saving of $16,000 per year in his light car fleet due to the use of throttle stops of the butterfly type. "We believe that the throttle stop is a major reason for our vehicles going 25,000,000 miles without a fatal accident as compared to the 1938 Georgia average of only 4,400,000 miles per fatality," he said.

Emphasizing the importance of keeping gasoline and oil mileage records as part of economy procedures, Mr. Whitfield voiced the opinion that:

"The carburetor holds the purse strings of half the expenditure for operation and maintenance and hence gasoline mileage deserves more attention than any other phase of maintenance."

Whitfield Paper Discussion

Discussion following Mr. Whitfield's paper ranged over wide areas, but focused strongly on ways and means to improve the effectiveness of "pooled" car operations; the comparative efficiency of "engineered" as opposed to "heavied-up" light vehicles for certain types of operation; and determination of the point at which replacement instead of further repairs is most advisable. Discussion at this session developed also one or two more unsettled arguments on private vs dealer-service for fleets.

E. W. Jahn, Consolidated Gas, Electric Light & Power Co. of Baltimore, emphasized the necessity of having vehicles in a pooled operation which are pleasing to the employees who have to use them. When the men don't like a car, he said, they manage to maltreat it so it won't stand up. "Human nature as well as operating conditions have to be considered," he stated. He also pointed to dangers in sticking too closely to a single make of vehicle, not only because of the possible ill-effect on competing local dealers who may be customers of the fleet-operator's organization, but also because one or two vehicles of a different make are not enough to base judgments on. An operator needs at least 10 vehicles of a given make to get the real facts about its operation, Mr. Jahn said – and Mr. Whitfield later emphasized his agreement with this point of view. Mr. Jahn also said that he makes an economic study of the past performance of every vehicle when the particular make is being considered for replacement.

Mr. Jahn's statement that his organization has not made any major overhauls for a number of years, but instead has replaced most vehicles around 45,000 miles, brought agreement with this policy from J. F. Winchester, Standard Oil Co. of N. J., and several other commentators.

Debate on the relative merits of the "heavied-up" light vehicle against the "engineered" vehicle brought comments from Messrs. Jahn, Glynn, Winchester and Axelson. Mr. Jahn tended to lean toward the "engineered" vehicle despite an experience which he cited as turning out favorably for a "heavied-up" unit. Mr. Glynn strongly opposed the "heavied-up" vehicle idea, because he believes that when you have finished with such a job "you still have something that just ain't." Mr. Winchester voiced his belief that the so-called light vehicle can be properly engineered to do certain types of job – not just "heavied-up" – so that it will give performance on those jobs equal to that of higher-priced and heavier vehicles. In such cases, he said, even though maintenance costs be higher, they do not overcome the savings from investments that otherwise would have been made in more expensive equipment.

Capt. Axelson spoke vigorously in favor of the "heavied-up" units, stating that his organization has been using such vehicles in tough operations, running up mileages as high as 100,000 to 150,000 miles, with resulting costs that he is willing to match with anybody. His vehicles average better than 80,000 miles, he stated, and overall costs are low.

Harry O. Mathews, Public Utility Engineering and Service Corp., laid stress on the strong influence which management attitude has on efficient fleet operation and maintenance. If the fleet supervisor is doing a job that is satisfactory to management, he can assume he is doing well. The success of a pooled equipment operation also depends heavily on management attitude, Mr. Mathews pointed out. The various department heads involved, by better planning of their work and by taking an interest in the efficient use of the vehicles, can permit great efficiencies in the operation which otherwise would not be possible. He cited several instances where this had occurred.

Several discussers, notably Mr. Glynn, emphasized the point that high-mileage is not at all a gage of efficiency in the use of many public utility vehicles. Drivers of utility company vehicles are workers, not drivers, Mr. Glynn pointed out, and every mile they drive is just so much time out of productive labor. Mileage should be cut down – not built up – on such working vehicles, Mr. Glynn showed. Echoing this sentiment, Mr. Jahn said: "Every mile such trucks make is unproductive."

Compulsory Inspection Praised and Questioned

Stephen Johnson, Jr., Bendix-Westinghouse Automotive Air Brake Co., was chairman of the closing session Friday afternoon at which two important state officials supported the efficacy of compulsory motor-vehicle inspection systems and presented practical examples from their own experience to show why such systems are needed and the effectiveness with which they are working out.

D. M. Baldwin, Motor-Vehicle Department, State of Virginia, said near the beginning of his talk that accident figures are not very conclusive in showing the number of accidents caused by defective vehicles, admitting that "they show that less than 10% of the vehicles in fatal accidents were reported as defective, and only about 5% of those in non-fatal accidents were so reported."

He expressed the opinion, however, that in many accidents it is impossible to tell after the accident what the condition of the car was before the crash; that it seems only logical to assume that an accident which was blamed on speed, for example, might have been avoided if the vehicles involved had had better brakes, or better steering gears or better tires; and that "even if mechanical defects can be proved responsible in 10% of the cases," it is sound policy to spend 10% of our time and effort and money on improving the mechanical condition of motor vehicles.

Compulsory inspection, Mr. Baldwin said, tries (1) to discover mechanical defects which may affect the safe operation of the vehicle and (2) to educate the driver. Two main systems are used, he explained, one in which licensed garages do the inspection work and the other in which the inspections are made by state-operated stations.

One fallacy of the licensed garage system, used by Virginia and Pennsylvania, he said, is that the state asks a business man who depends on the good will of the public, to be a policeman.

The first year of inspection in New Jersey, where state-operated stations are used, Mr. Baldwin said, was followed by a 30% reduction in fatalities, and credit was given in large measure to the inspection. In the last inspection in Virginia, he continued, 61.9% of the cars presented were found defective in the first check.

To emphasize his contention that compulsory inspection has an appreciable effect in reducing accidents, Mr. Baldwin cited specific examples of unusually bad vehicles presented for inspection in Virginia, including one in which peach-basket hoops were being used for brake bands. Concluding he said:

"There are several ways of carrying on an inspection program, some better than others, but we feel that no matter what method is adopted, if it is conscientiously carried through, it will be found very much worth while. It must be balanced by other parts of a comprehensive state safety program to be most effective, but we strongly recommend it for adoption in states

Technical Session and Dinner Speakers at Pittsburgh Meeting

(1) P. H. McCance, vice-president, The Philadelphia Co., was the chief speaker at the Transportation Dinner

(2) SAE President Arthur Nutt spoke briefly at the Transportation Dinner

(3) Randolph Whitfield, Georgia Power Co., talked of economic aspects of public utility fleets

(4) D. M. Baldwin, Motor-Vehicle Department, State of Virginia, and (5) Capt. T. N. Boate, Pennsylvania Motor Police, were the speakers at the Motor-Vehicle Inspection Session

not now having it, and urge cooperation with it in states now having state-wide inspection."

Capt. T. N. Boate, Pennsylvania Motor Police, strongly supported the efficacy and necessity of compulsory inspection, as had Mr. Baldwin. He too, admitted the uncertainty of available statistics, but urged inspection as a safety-producing factor in any case.

Backed by enlarged photographs of serious accidents in which equipment failures had played a part, Capt. Boate cited dramatic experience records to show the dangers of poor equipment on the highways. He described the educational program including 47 clinics and meetings which Pennsylvania is using to make its inspection work more effective and said that the best way to eliminate the dishonest inspection garage is to educate the public to insist on proper inspection and repair.

He outlined the historical development of compulsory inspection in Pennsylvania which began with a voluntary "Save-A-Life" campaign in 1928, and then went on to describe the methods by which the State Police, now in charge of supervising inspection garages, carry out that supervision. Each station is visited at least once in every campaign, discrepancies are investigated, sticker-purchases are checked and various other precautions are taken to insure honest and efficient handling. Since Sept. 1, 1939, when the State Police took over this supervisory responsibility, the number of licensed stations has been reduced from 9500 to 7900, Capt. Boate stated.

Capt. Boate concluded with a compliment to motor-vehicle manufacturers for the safety they have built into their vehicles and a final expression of his strong belief in the desirability of compulsory inspection to bring about accident reductions.

Compulsory Inspection Discussion

Opinion among discussers as to the practical effect of compulsory vehicle inspection systems was divided almost equally. J. F. Winchester, Standard Oil Co. of New Jersey, praised strongly the efficiency and effectiveness of the New Jersey inspection operation, stating that the large fleet of vehicles under his supervision has gotten better checking by the State inspection stations than had been possible by his organization's own inspection system. The State checks also have stimulated interest in newer apparatus in fleet shops, Mr. Winchester said, and have had a real effect on improvement of highway safety in general.

Strongest proponent of an opposing viewpoint was M. C. Horine, Mack Mfg. Corp., who believes that neither Mr. Baldwin nor Capt. Boate succeeded in making out a sound case for compulsory vehicle inspection as a major deterrent to accidents. Both speakers, Mr. Horine pointed out, dismissed available statistics as being inconclusive, although such figures as are available definitely fail to support the claim that compulsory inspection is a real factor in bringing about greater highway safety. Mr. Horine did not deny that inspection *might* be a safety factor, but insisted that no case had been made to prove that it *is*. He questioned that a 10-min inspection twice a year could insure the proper condition of the inspected vehicles for the intervening six months' periods between inspections. Compulsory inspection, he urged, seems at best to be a minor element rather than a major one and pointed out that improved safety records obviously involved a number of additional factors; the effect of compulsory inspection alone has not been segregated.

Much more important than inspection, Mr. Horine believes, is improvement in driver care and ability and consistent improvement of inadequate road conditions. "I would be better able to believe in the sincerity of states with compulsory inspection systems," he said, "if those same states did not divert sometimes as much as 60% of special motor-vehicle tax collections to purposes other than improvement of highways needed to bring about important safety gains."

David Beecroft, Bendix Aviation Corp., cited Virginia figures to show that about the same number of vehicles have been rejected at each inspection for many years and Mr. Horine

Some Pigott Maxims

R. J. S. Pigott, Gulf Staff Engineer, hit out straight from the shoulder in a brief talk on "Gasoline Economy" when fleet operators visited the Gulf Laboratories at Harmarville, Pa., during the National T&M Meeting in Pittsburgh last month. Among other things, he said:

▼

". . . . Manufacturers' standards for initial spark advance are rather good, our test information finds. They do not give maximum performance, but they do give within 2 to 3% of it, and the economy is noticeably better than if the ignition were set for maximum performance."

▼

". . . . Automatic spark advance on engines as manufactured varies quite a little, not only between different makes but from car to car of the same make. It therefore appears very desirable to see that adequate maintenance is applied. . . ."

▼

". . . . It is very easy to overdo leaning-out mixtures for general operation. . . . economy also falls off on the lean side, only not so fast."

▼

"After all, substantially the only way of cooling an exhaust valve is to let it sit down on the cooler seat. If the seat is kept too narrow, the amount of heat to be transmitted is obviously cut much in proportion to reduction of width of the seat."

▼

"There are many manifolds now on the market that are not good and, curiously enough, some experimental manifolds with a very simple construction give as good or better results than most of the elaborate manifolds applied to some of the engines."

▼

"It is well to keep the temperatures of all parts from the gasoline tank and gas lines to the bowl of the carburetor as cool as possible, because the loss may amount to from 3 to 10% of the total gasoline, and in addition, since the loss is all from light ends, the gas actually delivered to the engine may be noticeably less in octane rating than the original gas put into the tank."

▼

"The point appears now to have been reached where some attention must be given to transferring back again some of the cooling that has been handed over to the oil system instead of the radiator."

▼

"It has been found that temperatures below about 140 F in either the jacket or the crankcase are apt to result in bad winter sludge and it does not make any difference what make of oil is in the crankcase."

R. J. S. Pigott

"We would like to see a much greater introduction of oil coolers and heaters into the engines in the next few years."

▼

"In most modern engines, the valve timing is arranged for top-speed, wide-open throttle performance, and, as a consequence, lower-speed, part-throttle performance is somewhat damaged due to the fact that too much blow-back occurs."

▼

"The main difficulty with automatic chokes seems to be that the thermostats have very little power and therefore the choke sticks very readily as soon as the butterfly becomes in the least fouled."

▼

"It is now fairly well recognized that there is no appreciable difference in power or economy for any standard motor or premium gasoline when used in an engine designed for the motor grade octane number, provided the ignition and carburetor are adjusted to suit the gas that is being used. . . ."

▼

". . . . the change to very light lubricants can be overdone."

▼

"Most of us would be ready to recognize that a great deal of the bearing and cylinder troubles in present-day engines do not originate so much with the oil as with the design, and we shall be forced to recognize very definitely in the next few years that prescription oils are not the sole answer to an incompletely worked out design."

questioned whether this did not indicate that little progress is being made from a safety standpoint.

Mr. Beecroft agreed that available accident statistics on the part played by vehicles in accidents are not reliable, and urged that future data be broken down to show car and truck figures separately. This would be one means of increasing public confidence in the data, he stated, emphasizing that such increased confidence is much to be desired. He pointed out, too, that compulsory inspection cannot be a panacea, but rather must be a single element in a constantly widening safety program.

In response to a question from Mr. Beecroft, Capt. Boate said that he feels the Pennsylvania 50 mph speed limit enforcement has definitely contributed to a reduction in fatal accidents.

R. M. Welker, Gulf Oil Corp., expressed the opinion that Pennsylvania inspection had done much to improve the headlight situation, and H. D. Hukill, Bendix Aviation Corp., learned in response to a question that Pennsylvania tests brakes by the road test method.

Youngren Explains the Hydra-Matic Transmission

● Chicago

Enter the "Brain Box!" In custody of Harold T. Youngren, chief engineer of the Olds Motor Works Division of General Motors Corp., this mechanical contrivance, which has set the tongues of automotive men wagging whenever new trends in car developments are discussed, checked in for a personal appearance at the Chicago Section's April meeting and proceeded to command the deep interest of some 200 or more members and guests assembled to learn about Oldsmobile's new Hydra-Matic 4-speed automatic transmission.

Small in weight and size, this box-shaped device attached to the side of the transmission and styled as the shift valve box assembly, was described by Engineer Youngren as the key to the successful development of the new automatic transmission which succeeds the semi-automatic unit which Olds brought out in May, 1937. This semi-automatic unit, 30,000 of which are in service, perfected after some seven or eight years of research and development, functions through cams, levers and rods, whereas the new shift control, its successor, operates through a liquid coupling by oil pressure and is fully automatic, displacing the conventional clutch and pedal.

In explaining the design and construction of the Hydra-Matic transmission, Speaker Youngren, who was introduced by Technical Chairman Raymond E. Dowd, Russell Mfg. Co., showed on the screen a series of explanatory diagrams and illustrations in a step-by-step description of this 4-speed automatic transmission and how it operates. Application of power comes through the liquid coupling, consisting of two pressed steel circular members, one functioning as a centrifugal pump, supplying oil under pressure to the other member which functions as a motor or driving member to propel the car. The power is transmitted by the simple process of accelerating the oil in the first member and decelerating it in the second.

So gently does the coupling unit take hold, the speaker said, that it is impossible to stall the engine by a careless start. Stalling the engine on an upgrade is likewise impossible with this device, since the engine cannot be stalled by the coupling action. Deceleration of the oil in the driven member is converted into torque for driving the car.

The transmission, he explained, has a lever on the steering column with four positions, neutral, high-range, low-range and reverse. It

(*News of Society continued on page 25*)

New Members Qualified

These applicants who have qualified for admission to the Society have been welcomed into membership between March 15, 1940, and April 15, 1940.

The various grades of membership are indicated by: (M) Member; (A) Associate Member; (J) Junior; (Aff.) Affiliate Member; (SM) Service Member; (FM) Foreign Member.

Baltimore Section

JOHNSON, JAMES NELSON (A) vice-president, operations, Horton Motor Lines, Inc., 2101 Washington Blvd., Baltimore.

Buffalo Section

DUDLEY, ERIC (M) materials engineer, Curtiss Aeroplane Division, Curtiss-Wright Corp., Kenmore Ave. & Vulcan St., Buffalo.

Canadian Section

GAYFER, WALTER R. (A) purchasing agent, International Harvester Co. of Canada, Ltd., Sherman Ave., North, Hamilton, Ont.

WEBBER, ROY H. (A) owner, Webber Machine Co., Toronto, Ont. (mail) 15 Alcom Ave.

WELLER, HARRY JOHN EDWARD (M) chief engineer, Canadian Associated Aircraft, Ltd., Beaver Hall Bldg., Beaver Hall Hill, Montreal, Que.

Chicago Section

BRODIE, A. L. (M) technologist, Texas Co., 332 S. Michigan Ave., Chicago.

FISHER, CLARK ANDERSON (J) engineer, Sinclair Refining Co., East Chicago, Ind. (mail) 4235 Magoun Ave.

LAMB, GEORGE GOODRICH (M) research chemical engineer, Standard Oil Co. of Ind., Research Dept., Whiting, Ind.

LARSEN, GILBERT E. (A) garage superintendent, Ward Baking Co., 5659 S. La Salle St., Chicago (mail) 8331 S. Langley Ave.

LEFEVRE, ARDEN W. (M) chief engineer, Stewart-Warner Corp., 1826 Diversey Parkway, Chicago (mail) 5415 N. Campbell Ave.

O'CONNOR, JOHN B. (A) sales engineer, Shakeproof Lock Washer Co., 2501 N. Keeler, Chicago.

RICE, FRED W. (A) Cushman Motor Delivery Co., 315 N. Ada, Chicago.

WILLIAMS, LLOYD E. (A) assistant plant manager, Pioneer Paper Stock Co., Division of Container Corp. of America, 430 W. Ohio St., Chicago.

(*Concluded on page 23*)

SAE *Coming* EVENTS

Baltimore – May 9

Engineers Club; dinner 6:30 p.m. Open discussion on Transportation – J. F. Winchester, Standard Oil Co. of New Jersey. Tenth Anniversary Meeting of the Section, to which all Past Chairmen are invited.

Buffalo – May 14

Hotel Statler; dinner 6:30 p.m.

Canadian – May 17

Oshawa, Ontario; dinner 7:00 p.m.

Chicago – May 14

Chicago Municipal Airport; dinner 6:45 p.m. Experiences in Test Flying – "Benny" Howard, vice-president, Howard Aircraft Corp. The Advantages of the Stewardess System – discussion by several of the stewardesses. In addition to the above program, at 4:00 p.m. there will be an inspection trip around the airport, with courtesy test flights at 5:00 p.m.

Cleveland – May 24

Chagrin Valley Country Club; annual outing of the Section.

Detroit – May 20

Hotel Statler; dinner 6:30 p.m. Design for Welding – E. W. P. Smith, consulting engineer, Lincoln Electric Co., and Lewis M. Benkert, Progressive Welder Co.

Indiana – May 9

Antlers Hotel, Indianapolis; dinner 6:45 p.m. Debate between the students of University of Michigan and Purdue University. Resolved, that the Two-Cycle Diesel Offers Greater Commercial Possibilities for the Automotive Field than Does the Four-Cycle Diesel.

May 7-8

National Production Meeting
Hotel Bond – Hartford, Conn.

●

June 9-14

Summer Meeting
The Greenbrier –
White Sulphur Springs, W. Va.

●

Oct. 14

Annual Dinner
Hotel Commodore –
New York City

●

Oct. 31, Nov. 1-2

National Aircraft Production Meeting
(and Engineering Display)
Hotel Biltmore – Los Angeles

Metropolitan – May 23

Inspection trip to LaGuardia Airport, starting at 3:30 p.m. Dinner 6:30 p.m. in the Kitty Hawk Room at the Airport.

Milwaukee – May 3

Wisconsin Club; dinner 6:30 p.m. Ladies' Night.

Northern California – May 14

Oregon – May 10

Portland.

Philadelphia – May 8

The Penn Athletic Club; dinner 6:30 p.m. Section Frolic – Home Talent, or Amateur Night.

Pittsburgh – May 16

County Airport; 2:00 p.m. Inspection of the County Airport.

Southern California – May 10

Elks Temple, Los Angeles; dinner 6:30 p.m. Diesel Engines in Motor Trucks – Charles G. Anthony, general manager, Pacific Freight Lines, Inc. Butane Engines in Motor Trucks – E. E. Tattersfield, president, Butane Division, Electric & Carburetor Engineering Co.

Southern New England – May 7-9 and May 24

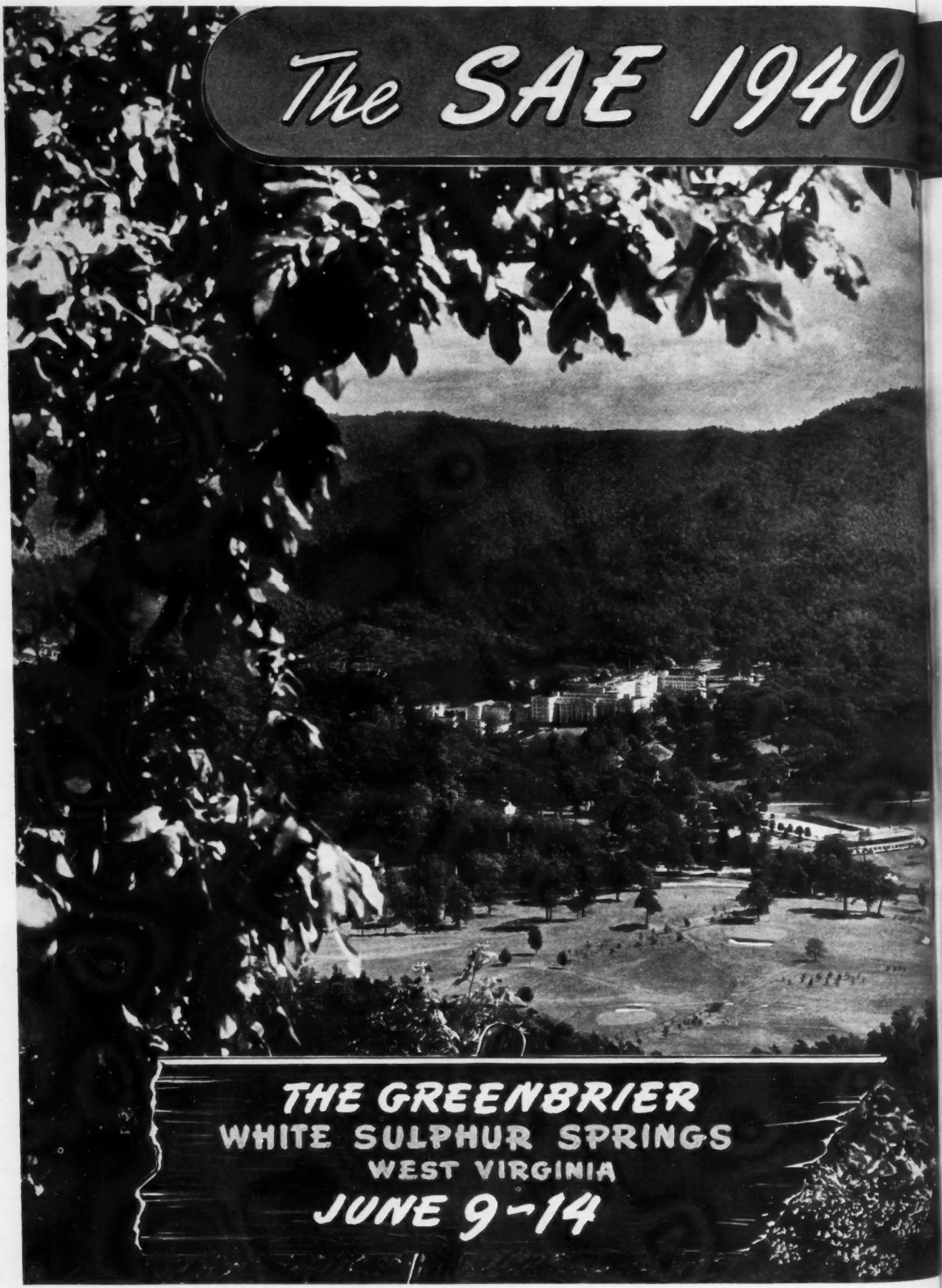
May 7-9 – Participation in National Production Meeting of the Society, Hotel Bond, Hartford, Conn.

May 24 – Shuttle Meadow Club. Annual Summer Meeting. Golf and sports in afternoon – entertainment in the evening.

Syracuse – No Meeting

Washington – May 14

Cosmos Club; dinner 6:30 p.m.


The SAE 1940
THE GREENBRIER
WHITE SULPHUR SPRINGS
WEST VIRGINIA
JUNE 9-14

SUMMER MEETING

Celebrates the Society's 35th Anniversary

CELEBRATING its 35th Anniversary the SAE keys its Summer Meeting theme to the future. Every technical paper deals with "what's-to-come" in some phase of the industry.

Passenger-Car Riding Comfort . . . High Altitude Flying . . . Improvements in Gasoline . . . New Applications of Aluminum in High-Speed Diesels . . . Possibilities of Low-Volatility Aviation Fuels . . . are a few of the many vital topics which will stimulate keen discussion at 12 lively sessions.

A super 35th Anniversary Banquet opens the meeting Sunday night. Past-President David Beecroft will vision "The Next 35 Years" based on trends in automotive progress revealed in the research laboratories of the nation. President Arthur Nutt will preside.

A Birthday Dance . . . Golf . . . Tennis . . . Swimming . . . Horseback Riding . . . Plenty of time is scheduled for these diversions. They are all part of the SAE's greatest Summer Meeting program.

■ ■ ■ **WATCH YOUR MAIL FOR A COMPLETE PROGRAM** ■ ■ ■

About SAE Members:

Acting on the advice of his physician **W. H. BEAL** recently resigned as president of the Aviation Mfg. Corp. Two years ago he suffered from a serious illness and he requested the management to relieve him of his duties so that he might thoroughly recuperate. After a complete rest he will continue to serve the organization in a consulting capacity, it has been announced. He has been identified with Aviation & Transportation Corp., the Aviation Corp., the Aviation Mfg. Corp. and its affiliated companies for a number of years, and has played an important part in their development.

J. H. HUFF, metallurgist, Curtiss Propeller Division, Curtiss-Wright Corp., and **F. S. KLOCK,** metallurgist, Hamilton Standard Propellers, Division of United Aircraft Corp., have been appointed to the Aircraft Materials Division of the SAE Standards Committee.

JAMES Y. SCOTT was elected president of the Van Norman Machine Tool Co., Springfield,

James Y. Scott
Elected President

Mass., at the March 5 meeting of the company's board of directors. Previously he was executive vice-president and treasurer.

RICHARD H. JOHNSON, formerly chief engineer, oil engines, with Ingersoll Rand Co., Boston, has joined Briggs & Stratton Corp., Milwaukee, as development engineer.

ADAM G. ROTH has been named president of Aircraft Engineering Products, Inc., Clifton, N. J. Previously he was development engineer with Air Associates, Inc., Garden City, N. Y.

C. H. KINDL, former general manager of the Delco Products Division, General Motors Corp., Dayton, Ohio, has been named a vice-president of the National Cash Register Co., of the same city.

Air Lines Honored

No fatality or serious injury to passenger or crew for an entire year is the record of air lines of the United States commemorated by the National Safety Council at a banquet in Washington, April 8. In this year of safe transportation from March 27, 1939, to March 27, 1940, almost 822,000,000 passenger miles were flown over a network of 36,500 miles of airways. For one passenger to cover this entire distance would require 685 years of constant flying. Commemorative awards presented at the banquet to all air lines of the United States were received by **COL. E. S. GORRELL,** president, Air Transport Association of America. A special award for overseas flight was made to Pan American Airways. **DR. GEORGE W. LEWIS** was vice-chairman of the National Safety Council Aviation Safety Award Committee.

HAROLD G SMITH has been appointed chief engineer of the engine division of the Buda Co., Harvey, Ill.

LEE M. CLEGG, senior vice-president, Thompson Products, Inc., Cleveland, Ohio., was elected executive vice-president at a recent

Lee M. Clegg
Advanced by
Thompson Products

board meeting of his company. Mr. Clegg started with Thompson Products in 1919 as a stock chaser in the factory following his graduation from the Case School of Applied Science. En route to his present position he was junior salesman in the original equipment division, sales manager, and vice-president. He was named to the board of directors in 1935.

W. ROPER LINDSAY has taken the position of transport manager with the Ham River Grit Co., Kingston, Surrey, England. He formerly was in the service department of Henry Ford & Son, Ltd., County Cork, Ireland.

P. S. PARKER relinquished his position as works manager of Airzone, Ltd., Sydney, Australia, to become general manager of Frank G. Spurway & Sons Pty., Ltd., of the same city.

W. H. RAGSDALE, formerly engineer with the Monarch Governor Co., Detroit, has joined the Packard Motor Car Co., Detroit, as test engineer, marine division.

C. F. KETTERING, vice-president, General Motors Corp., was toastmaster at the banquet celebrating the United States Patent Law Sesquicentennial in Washington, April 10. Mr. Kettering was chairman of the Sesquicentennial National Committee, which included SAE **PRESIDENT ARTHUR NUTT** as representative of the Society. Heading the executive committee was **THOMAS MIDGLEY, JR.,** vice-president of Ethyl Gasoline Corp., who represented the American Chemical Society on the National Committee.

S. E. DITHMER, sales manager, General Motors Japan, Ltd., Osaka, Japan, is visiting this country.

C. C. CARLTON, vice-president, Motor Wheel Corp., is vice-chairman of the 1940 Michigan Statewide Safety Conference to be held at Lansing, May 22-24.

L. H. SMITH, formerly engineer in charge of coach and body department, General Motors Truck & Coach, Pontiac, has been named assistant vice-president in charge of engineering, General American Aerocoach Co., Chicago, Ill.

IRVING H. JUDD now is located at the Norfolk, Va., plant of Mitchell & Smith, Inc., Detroit. He formerly was chief engineer, Whitehead & Kales Co., River Rouge, Mich.

VAN WYCK HEWLETT has joined the engineering department of Vought-Sikorsky Aircraft Division of United Aircraft Corp., Stratford, Conn.

EDWARD FENN, until recently Pratt & Whitney Aircraft's project engineer on ignition, East Hartford, Conn., is in Australia as chief engineer of Commonwealth Aircraft Corp., Melbourne, Australia.

JOHN MACON THOME has joined Fairbanks, Morse & Co., Beloit, Wis., as layout and design draftsman. Previously he was with the Caterpillar Tractor Co., Peoria, Ill.

WARREN J. BELCHER has been advanced from the position of chief engineer, Whitney Chain & Mfg. Co., West Hartford, Conn., to the office of vice-president.

Changes Bring New Posts To Timken-Detroit Executives

Willard F. Rockwell

Col. H. W. Alden

Willard F. Rockwell was elected chairman of the Timken-Detroit Axle Co. at the annual meeting of the stockholders held in Canton, Ohio, last month. He succeeds Col. H. W. Alden, one of the incorporators of the company, and chairman of its board of directors since 1922. Col. Alden, who has twice been president of the SAE, will continue as a director of the company in charge of engineering. Walter F. Rockwell, former vice-president, succeeds Willard F. Rockwell as president.

W. E. ROOTES, chairman of Rootes, Ltd., London, England, and president of Motor Manufacturers & Trades, Ltd., is leading an export drive by British manufacturers.

Among United Aircraft Corp. personnel slated to lecture before the class studying "Elements of Aviation" at the Connecticut State Teachers' College are: **IGOR I. SIKORSKY,** engineering manager, Vought-Sikorsky Aircraft Division; **C. H. CHATFIELD,** director of research, and **JOHN G. LEE,** assistant director of research, United Aircraft; and **REX BEISEL,** chief engineer, Vought-Sikorsky Aircraft.

E. WADSWORTH STONE, research and consulting engineer, Bigelow-Sanford Carpet Co., Inc., Thompsonville, Conn., is scheduled, May 2, to address the Spring Meeting of the American Society of Mechanical Engineers, Worcester, Mass. His subject will be "Purchase and Use of Fuel."

CHARLES H. COLVIN, vice-chairman of the SAE Aircraft Activity Committee, has severed his connection with the Kollsman Instrument Division of the Square D Co., of which he was general manager, to join the United States Weather Bureau in Washington as special assistant to the chief. He will be in charge of reorganizing the entire instrumentation of the Weather Bureau, with particular emphasis on upper air measurement as used for airway weather service.

Charles H. Colvin
Joins U. S. Weather Bureau

JAMES N. MEZEY has joined the Glen Moore Garage, Syracuse, N. Y., as automotive engineer. Formerly he was service salesman, motor clinic division, Gulf Oil Co., New York.

E. P. LOMASNEY, formerly chief chemist, Red River Refining Co., Chicago, has joined Faber Laboratories, Inc., as chemical engineer. His offices are in Chicago.

Since the first of the year **H. D. STANLEY** has been general manager of Non-Spill Batteries, Inc., New Brunswick, N. J. Previously he was vice-president, production, Perrine Quality Products Corp., Waltham, Mass.

A. J. HARFORD, formerly automotive engineer, Alba Petroleum Co. of Australia, Pty., Ltd., Melbourne, Australia, has been named general manager of Maws, Pty., Ltd., of the same city, manufacturers of automotive products.

M. B. COMBERIATE, former junior marine engineer, United States Navy Department, Norfolk, is with the Glenn L. Martin Co., Baltimore, Md., as equipment designer.

HARRY A. OEST, engineering officer, United States Coast Guard, has been moving around quite a bit. "In Alaskan waters last September; Azores Islands in February; and now off to 600 miles east of Bermuda to 'wet nurse' Atlantic Clippers on a 30-day weather patrol," he writes. The U.S.S. Duane is his ship.

THOMAS A. McGREGOR is engineering checker with the Lockheed Aircraft Corp., Burbank, Calif. He was chief engineer, American Forging & Socket Co., Pontiac, Mich.

List of SAE Members in Active Service Growing

As SAE Headquarters receives news of members in active service of the countries engaged in war, the Journal will list their names, former company connections, and, when available, their military titles

From Egypt comes information that **John F. Murrell-Wright,** production division, General Motors Near East, S/A, is "with H.M. Forces." Australian Member **H. F. Hayward,** service manager, York Motors, Pty., Ltd., is in military service. **George M. Stephen,** Board of Education, Toronto, Canada, has the title of sergeant-major with the 48th Highlanders of Canada. **Robert D. Byers,** manager, Border Cities Aero Club, Roseland, Ontario, has joined the Royal Canadian Air Force as examining officer and flying officer.

Capt. K. J. G. Bartlett, European manager, Bristol Aeroplane Co., Ltd.; **Major S. A. Currin,** director, Simms Motor Units, Ltd.; **Maurice Hudlass,** transportation, technical adviser to motor competitions department, Royal Automobile Club; and **Justin H. Wells,** director, Germ Lubricants, Ltd., are English members in military service.

In French service are **Lieut. Michel Dervieu,** Establissements Laffly; **Etienne Ploix,** Societe Nationale de Moteurs; and **Jean Pontremoli,** former chief engineer, aeronautic section, Alvis, Ltd., England.

A. S. ELLIS, assistant director of mechanization, Canadian Department of National Defense, is now located at the Canadian Mechanization Depot, Southampton, England. Before undertaking this work, Mr. Ellis was general service manager, Ford Motor Co. of Canada, Ltd., Windsor, Ontario.

P. M. HELDT technical editor, *Automotive Industries*, addressed the Cornell University Student ASME Branch, April 20. His subject was "A History of Automobiles."

I. LOUIS CARRON, former body engineer for the Chrysler Corp., who was 1939 SAE vice-president representing Passenger-Car Body Engineering and a former member of the Detroit Section's Governing Board, is sales manager and engineer for Prestole Devices, Inc., division of Detroit Harvester Co.

I. Louis Carron
To Prestole Devices

MOORE KELLY, JR., formerly salesman with the Bound Brook Oil-less Bearing Co., Detroit, has joined the staff of Power Battery Co., Richmond, Mich.

CLINTON BRETTELL, recently engineer with the Surface Transportation Corp., New York, has been named manager of the motor-vehicle department, Dellwood Dairy Co., Inc., Yonkers, N. Y.

DONALD BLANCHARD, secretary, SAE Engineering Relations Committee, was one of the speakers at the Connecticut Highway Safety Commission's state-wide conference held at Yale University, March 27.

HENRY J. FISCHBECK, chief metallurgist for Pratt & Whitney Aircraft for the past ten years, has been promoted to the position of process engineer, according to an announcement by the engine manufacturing division of United Aircraft Corp. In his new position, Mr. Fischbeck will keep in close contact with all manufacturing and engineering departments and will maintain control of processes involved in the manufacture of the company's aircraft engines. Active in SAE work, Mr. Fischbeck is vice-chairman of the Aircraft Materials Division of the Society's Standards Committee.

Henry F. Fischbeck
Promoted

DR. GUSTAV EGLOFF, director of research, Universal Oil Products Co., Chicago, envisioned an era of big automobiles propelled by engines the size of suitcases, with the development of super-power motor fuels, in a paper presented before a Columbus, Ohio, meeting of the American Petroleum Institute, April 12. He described triptan, a 125-octane-number fuel; the laboratory cost of which has been reduced from $3600 to $50 per gal. Research workers, he stated, hope eventually to bring it down to near the present price levels of popular gasolines. He also explained how natural gas could be compressed into tanks at a pressure of 5000 lb per sq in. and used as motor-vehicle fuel.

J. F. WINCHESTER, Standard Oil Co. of N. J., who is president of the National Motor Truck Show, Inc., and **HARVEY D. GIBSON,** chairman of the board of the New York World's Fair, recently signed a contract for a cooperative National Highway Transportation Show to be held this year at the New York Fair. Twenty firms are expected to display more than 60 truck models.

H. M. BRAMBERRY, Perfect Circle Co., Hagerstown, Ind., who is chairman of the SAE Indiana Section's meetings committee, left April 5 for a month's stay in California to recuperate from a recent illness.

J. E. ECHLIN, president, Echlin Mfg. Co., formerly of San Francisco, writes that the entire plant of the company has been moved to New Haven, Conn. He will make his headquarters in that city.

CAPT. P. H. ROBEY, Wright Field, Dayton, Ohio, has been transferred, on temporary duty, to Maxwell Field, Montgomery, Ala., for the months of April, May, and June.

Since March 15, **NORMAN L. DEUBLE** has been assistant to vice-president, The Copperweld Steel Co., Warren, Ohio. Previously he was metallurgist with the Republic Steel Corp., Massillon, Ohio.

"Boring Mills in a Gear Shop," by **E. P. BLANCHARD,** sales manager, Bullard Co., and "Diesel and Gas Engine Load Characteristics," by **AUSTIN KUHNS,** executive engineer, Farrel-Birmingham Co., are among papers scheduled for presentation at the 24th annual meeting of the American Gear Manufacturers' Association, Asheville, N. C., May 20-22.

MAJOR MARK V. BRUNSON, Quartermaster Corps (Motors), War Plans Section, Office of the Quartermaster General, Washington, has been designated by the Secretary of War to command the General Headquarters Motor Transport Service on the Corps and Army maneuvers being conducted in the Atlanta-Jackson-San Antonio area during the months of April and May. Major Brunson is a member of the SAE Transportation & Maintenance Activity Committee.

Major Mark V. Brunson
Active in Maneuvers

A variable-pitch propeller, a cylinder assembly for an airplane engine, and other parts suitable for demonstration purposes have been donated to the College of Engineering, Cornell University, by Pratt & Whitney Aircraft. These additions to the equipment of the College were received through the efforts of **J. CARLTON WARD, JR.,** general manager of the company, who graduated from Cornell in 1914. Mr. Ward recently was named a member of the Cornell University Engineering College Council. Another SAE member serving on the Engineering Council is **THOMAS MIDGLEY, JR.,** vice-president, Ethyl Gasoline Corp.

Early last month **H. W. GRAHAM,** director of metallurgy and research, Jones & Laughlin Steel Corp., addressed members of the Pittsburgh Section of the American Institute of Mining & Metallurgical Engineers, the AIMME national bessemer committee, and the steel works section of the Engineers Society of Western Pennsylvania, at Pittsburgh He expressed his belief that today's economic trends contain elements favorable to a resurgence of the bessemer process of steel making.

E. R. STETTINIUS, JR., chairman of the board, United States Steel Corp., spoke on "Mutual Responsibilities of Business and the Public," at the April 11 meeting of the Economic Club of Chicago

J. P. EAGLES, formerly draftsman with Airzone Ltd., Sydney, Australia, is now associated with Raycophone Pty., Ltd., Annandale, New South Wales, Australia.

On Safety Conference Program

Among SAE members participating in the program of the Greater New York Safety Conference, April 16-18, were **JOHN F. CREAMER,** president, Wheels, Inc., and a vice-chairman of the SAE Metropolitan Section; **HAROLD HAMMOND,** director, traffic division, National Conservation Bureau, and secretary, Institute of Traffic Engineers; **WALTER HERFURTH,** delivery superintendent, R. H. Macy & Co., Inc.; **J. WILLARD LORD,** safety engineer, Atlantic Refining Co., and chairman, Atlantic Division, Petroleum Section, National Safety Council; **JEROME LEDERER,** chief engineer, Aero Insurance Underwriters, and secretary, aeronautical section, National Safety Council; and **T. P. WRIGHT,** vice-president, Curtiss-Wright Corp. **DAVID BEECROFT,** Bendix Products Division, Bendix Aviation Corp., represented the SAE on the general committee of the conference.

W. E. BAPTIST, who has been with de Havilland Aircraft Pty., Ltd., Sydney, Australia, is affiliated with General Motors Holden's Ltd., Melbourne.

J. C. HURLEY, who was district plant manager, sales and production, for the Lincoln Engineering Co., Detroit, is now handling the products of that and other companies as manufacturers' agent.

PAUL G. HOFFMAN, president of Studebaker Corp., and of the Automotive Safety Foundation, was scheduled to address the banquet of the Texas Safety Conference, held in Austin, April 16-17.

The appointment of **HERBERT MORLEY** as plant manager for all Detroit manufacturing units of Norge Division, Borg-Warner Corp., recently was announced. Mr. Morley has been manager of the heating and air-conditioning division, being responsible for manufacturing and sales. To his duties will be added the manufacturing management of the aircraft parts division and the hermetic Rollator compressor division, as well as special gears and transmission parts built for Norge products and for various automotive clients.

Herbert Morley
Assumes More Duties

WILHELM ORNSTEIN has been commissioned by the Turkish Government to organize what is to be the biggest motor car repair shop in Turkey. He formerly was secretary to the managing director of Lilpop, Rau & Lowenstein, S.A., Warsaw, Poland. Two months before the war, Mr. Ornstein writes, he had been sent to Vauxhall Motors, Ltd., England. He returned to Poland just 10 days before hostilities broke out. Owing to "the tragic events" he was obliged to leave for Rumania, and, after some stay in Bucharest, he went to Turkey upon invitation of the Turkish Government.

E. H. DIX, JR., chief metallurgist, Aluminum Co. of America, co-author with R. B. Mears of the paper, "Aluminum Aircraft Fuel Tanks," appearing in the Transactions Section of this issue, spent most of March visiting aircraft companies on the west coast. In Southern California he addressed more than 600 engineers on the theory and practice of heat treating aluminum alloys.

National attention should be turned to development of a source of rubber supply within the Western Hemisphere and at the same time barter exchange of cotton for rubber should be extended to provide adequate reserves of the raw material, **P. W. LITCHFIELD,** president of the Goodyear Tire & Rubber Co., told stockholders at the annual meeting of the company in Akron, March 25.

SAE PRESIDENT ARTHUR NUTT addressed a group of students at College of the City of New York on the evening of April 5. Active in arranging the meeting was W. L. Stork, assistant professor of drafting at the college, who cooperated with the student committee. The student chairman opened the meeting by introducing Prof. G. C. Autenrieth, supervisor of the CCNY mechanical plant. Prof. Autenrieth, after a brief welcoming address, called upon SAE General Manager John A. C. Warner to introduce President Nutt, who spoke on "What's Going On in the Air."

R. E. Clingan

R. E. Clingan, Chicago district sales manager of the Jones & Lamson Machine Co., died March 11 in St. Petersburg, Fla. He was 60 years old and had been a member of the SAE since 1913.

Mr. Clingan was born in New Haven, Conn., where he received his education and early training in engineering and machine shop practice. At the age of 19 he became associated with the F. B. Shuster Co., New Haven, where he worked for a number of years in the manufacturing and engineering departments.

He joined the Hess-Bright Co. (now SKF), Philadelphia, in 1908 and remained with them until 1919 when he went with the Bock Bearing Co., of Toledo, as vice-president and general manager. The year following he was made president and remained in that capacity until the company was sold to the Timken Roller Bearing Co. in 1927.

He at that time joined the Timken organization in an executive capacity and after remaining there until 1928, became associated with the New Departure Co. in Bristol, Conn., in charge of industrial sales. He resigned this position in 1934 due to illness, and after six months' rest, joined the Jones & Lamson Machine Co. as Chicago district sales manager. He made his home in Chicago until his death.

Gordon J. Monahan

The Canadian Raybestos Co., Ltd., has advised the Society of the sudden death of Gordon J. Monahan, sales manager of the company. He died Feb. 29 at Peterborough, Ontario. Mr. Monahan, who became an associate member of the SAE in 1930, had been affiliated with Canadian Raybestos for 14 years, and previously was with The Raybestos Co. of Bridgeport, Conn., for three years. He was well known in the automotive field and had taken part in many of its activities.

Mr. Monahan was born in Ottawa, Canada, in 1895. Before joining the Raybestos organization as salesman, he had done clerical work with the Home Bank of Canada and the Canadian Bank of Commerce.

James W. Hume

James W. Hume, vice-president and partner of Harley C. Loney Co., Detroit, died April 9 at his home in Ypsilanti, Mich. He was 61 years of age.

Mr. Hume, who was elected to membership in the Society early last year, had been affiliated with the automotive industry since 1919. In that year he left the munitions industry, in which he had been active since 1917, to join the Hayes Wheel Co., as superintendent of inspection. While with that company he also did development work on steel felloes and rims.

Starting in 1922 Mr. Hume spent four years in full charge of inspection for Jaxon Steel Products Co., and then affiliated with the Alloy Steel Spring Co. for a short period. In 1928 and 1929 he was with the Kelsey-Hayes Wheel Co. in charge of inspection at its west-end plant. The following year he joined the Harley C. Loney Co. as a partner, and during his period with that company devoted considerable time to the development and production of wheel balance weights.

(*Concluded from page 17*)

Cleveland Section

COLLYER, JOHN L. (M) president, B. F. Goodrich Co., Akron, O.

JACKSON, EDWARD D. (A) vice-president, Acrotorque Co., 4815 Lexington Ave., Cleveland.

KNIGHT, FLOYD CLEVELAND (M) assistant professor, mechanical engineering, Case School of Applied Science, University Circle, Cleveland.

WEBB, CHARLES R. (A) motor oil manager, Standard Oil Co. (Ohio), Midland Bldg., Cleveland.

Detroit Section

CHRISTENSON, A. W. (A) manager, Detroit branch, Binks Mfg. Co., Detroit (mail) 18685 Lindsay Ave.

HARRISON, JAMES R. (A) salesman, Wilcox-Rich Division, Eaton Mfg. Co., 9771 French Road, Detroit.

MANCHESTER, MITCHELL W. (M) assistant director, research aviation division, Ethyl Gasoline Corp., 723 E. Milwaukee Ave., Detroit.

O'CONNELL, FRANCIS P. (J) chemical engineer, Baldwin Rubber Co., 366 E. South Blvd., Pontiac, Mich. (mail) 45 Wenonah Drive.

POWERS, CALVIN F. (J) test engineer, Chevrolet Motor Division, General Motors Corp., Detroit (mail) 13220 Woodward Ave., Highland Park, Mich.

PRETZ, PHILIP H. (M) engineer, Cadillac Motor Car Division, General Motors Corp., 2860 Clark Ave., Detroit.

STEARNS, JOHN R. (A) salesman, Wilcox-Rich Division, Eaton Mfg. Co., 9771 French Road, Detroit.

STEELS, W. L. ROY (M) chief engineer, Coil Spring Dept., Eaton Mfg. Co., Spring Division, 9771 French Road, Detroit.

TELL, WILLIAM J. (M) chief body engineer, Cadillac Motor Car Division, General Motors Corp., 2860 Clark Ave., Detroit (mail) 13520 Griggs Ave.

TEMMING, WESLEY H. (J) metal checker, Fisher Body Division, General Motors Corp., Plant No. 1, Flint, Mich. (mail) 4529 Keats St.

TREMBATH, ROBERT S. (J) dynamometer operator, Reo Motors, Inc., Lansing, Mich.

VILLAIRE, JOSEPH W. (A) assistant chief inspector, Chrysler Corp., 12200 E. Jefferson Ave., Detroit.

WILEY, ROBERT D. (M) factory manager, Bundy Tubing Co., 10951 Hern, Detroit.

WILLIAMS, A. E. (M) assistant to chief engineer, chief of tank trailer division, Fruehauf Trailer Co., 10940 Harper Ave., Detroit (mail) 4627 Three Mile Drive.

Indiana Section

BAIN, W. RUSSEL (M) engineer, Allison Engineering Division, General Motors Corp., Indianapolis (mail) 4905 W. 15th St., Apt. 3.

Kansas City Section

CORBETT, ALLEN H. (A) sales manager, General Auto Parts Co., Kansas City, Mo. (mail) 1930 McGee.

Metropolitan Section

ARMSTRONG, WILLIAM (M) chief engineer, Dowty Equipment Corp., 25 Beaver St., New York.

BANCEL, PAUL (J) test engineer, Wright Aeronautical Corp., Paterson, N. J. (mail) 156 Highland Ave., Montclair, N. J.

CUSHMAN, MAURICE E. (J) stress analyst, Curtiss Propeller Division, Curtiss-Wright Corp., Clifton, N. J. (mail) 512 Valley Road.

FARNSWORTH, A. LAMONT (A) foreman, Kings County Buick, Inc., Brooklyn, N. Y. (mail) 2040 Coyle St.

GRADY, JAMES J. (J) production engineer, B. G. Corp., 136 W. 52nd St., New York (mail) 667 E. 29th St., Paterson, N. J.

GRAY, H. LIGGETT (M) assistant manager, assistant treasurer, Oakite Products, Inc., 22 Thames St., New York.

MUDGE, WILLIAM A. (M) metallurgist, development and research division, International Nickel Co., Inc., 67 Wall St., New York.

NICASSIO, NOEL JOHN (A) assistant supply manager, R. H. Macy & Co., Inc., 34th St. & Broadway, New York (mail) 760 67th St., Brooklyn, N. Y.

O'NEILL, JOHN V. (A) president, Metropolitan Equipment Corp., 45-21 37th St., Long Island City, N. Y.

RICHARDS, WILLIAM MERRIL SHAW (J) test engineer, Wright Aeronautical Corp., Paterson, N. J. (mail) 39 Claremont Ave., New York.

ROMIGH, ORIN L. (A) foundry foreman, National Meter Co., Brooklyn, N. Y. (mail) 665 88th St.

SCHWARZ, ERNEST I. (A) president, EIS Mfg. Co., Inc., Middletown, Conn. (mail) 2330 Lodovick Ave., New York.

WEHRMANN, WILHELM (M) chief shop instructor, Hemphill Schools, Inc., 31-28 Queens Blvd., Long Island City, N. Y. (mail) 43-29 Forley Ave., Elmhurst, L. I., N. Y.

WERNS, WILLIAM (A) mechanic, Brooklyn Bus Corp., 990 Third Ave., Brooklyn, N. Y. (mail) 86-78 78th St., Woodhaven, L. I., N. Y.

WHITLEY, ROBERT J. (M) operating department, Socony-Vacuum Oil Co., Inc., 26 Broadway, 12th Floor, New York.

Milwaukee Section

BRIGGS & STRATTON CORP. (Aff.) 2711 N. 13th St., Milwaukee. Reps: Armstrong, Werner E., engineer; Bair, Kenneth W., chief inspector; Beer, P. G., experimental engineer; Dorsey, Leonard J., plant superintendent; Gottlieb, Oscar F., development & experimental engineer; Heidemann, Erwin O., service engineer.

SWAIN, JOHN GRANT (M) sales manager, Waukesha Motor Co., Waukesha, Wis. (mail) 208 Windsor Drive.

New England Section

DORAN, JAMES A. (M) treasurer, general manager, Doran Ignition Corp., 70 Ship St., Providence, R. I.

GOOGINS, DANFORTH M. (M) automotive engineer, Socony-Vacuum Oil Co., Inc., 31 St. James Ave., Boston (mail) 56 Summer St., Kennebunk, Me.

Northern California Section

JACK, WILLIAM R. (A) vice-president, treasurer, Jack Heintz, Ltd., 2815 Middlefield Road, Palo Alto, Calif.

NEWTON, BEN (A) sales supervisor, Sunland Refining Corp., East & California Sts., P.O. Box 1285, Fresno, Calif. (mail) 2941 Washington St.

WAGAR, FRANK L. (A) manager, motor oil & grease sales, Tide Water Associated Oil Co., 79 New Montgomery St., San Francisco.

WALKER, ALVIN R. (J) research engineer Tide Water Associated Oil Co., Research & Development Dept., Associated, Calif.

WIMBERLY, DONALD C. (J) research engineer, Standard Oil Co. of Calif., Richmond, Calif. (mail) 1319 Bonita Ave., Berkeley, Calif.

Philadelphia Section

PECKER, JOSEPH S. (M) president, Machine & Tool Designing Co., 1011 Chestnut St., Philadelphia.

Pittsburgh Section

HALLAM, WALLACE (A) district manager, Mack International Motor Truck Corp., 5001 Liberty Ave., Pittsburgh.

Southern California Section

KAHN, ARNOLD A. (M) tool designer, Lockheed Aircraft Corp., Burbank, Calif. (mail) 1650 N. Kings Road, Hollywood, Calif.

MCCONIHE, PAUL M. (M) lubrication engineer, Seaside Oil Co., 330 State St., Santa Barbara, Calif.

NORTHROP, JOHN K. (M) president, Northrop Aircraft, Inc., Hawthorne, Calif. (mail) 3750 W. Crestway Drive, Los Angeles.

VAUGHN, WALTER (J) instructor, Curtiss-Wright Technical Institute of Aeronautics, Glendale, Calif. (mail) 4515¼ Willowbrook, Hollywood, Calif.

Southern New England Section

MOLLOY, RICHARD CLAIR (J) aeronautical engineer, United Aircraft Corp., East Hartford, Conn. (mail) 9 Tryon St., South Glastonbury, Conn.

RICHMOND, JOHN LLOYD (M) engineer, American Bosch Corp., Springfield, Mass. (mail) 20 Taft St.

SOHN, LEONARD B. (A) manager, service department, Brown & Thomas Automobile Co., 264 Whalley Ave., New Haven, Conn.

Washington Section

DANA, MARSHALL MERRITT, Lt.-Com. (S M) United States Navy, Bureau of Engineering, Navy Dept., Washington.

Outside of Section Territory

ANTHES, GARRISON P. (A) president, Anthes Force Oiler Co., Fort Madison, Iowa.

ARMISTEAD, GEORGE, JR. (M) assistant to vice-president, Republic Oil Refining Co., 612 Second National Bank Bldg., Houston, Tex.

COLLINS, WHITNEY (J) junior engineer, Aviation Mfg. Corp., Williamsport, Pa. (mail) 1139 W. Fourth St.

HANSON, A. C. (S M) charge of research, Rock Island Arsenal, Rock Island, Ill. (mail) 1716 Elm St., Davenport, Iowa.

SCHUMAN, G. W. (A) president, general manager, Schuman Carriage Co., Ltd., Honolulu, T. H.

SPEIR, MORGAN B., JR. (A) director of safety and personnel, Horton Motor Lines, Inc., P.O. Box 540, Charlotte, N. C.

SWENSON, WILLIAM E. (M) engine designer, Minneapolis Moline Power Implement Co., Minneapolis, Minn.

VAUGHAN, H. G. (A) 1st vice-president, Muskegon Piston Ring Co., Muskegon, Mich. (mail) Sparta, Mich.

Foreign

ANDERSON, KARL VOLMAR (F M) chief designer, Bolinder & Munktell A-B, Eskilstuna, Sweden (mail) Intagsgatan 9.

BERG, RENÉ (F M) manager president, Societe René Berg, 71 rue de Provence, Paris, France.

DILLSTROM, TORBJORN VIKTOR (F M) chief engineer, Hesselman Motor Corp., Ltd., Henriksdal, Stockholm, Sweden.

HELLIER, HENRY GEORGE (F M) automotive engineer, charge of transportation, United British Oilfields of Trinidad, Ltd., Point Fortin, Trinidad, British West Indies.

KEON, HERBERT GERALD (A) proprietor, Eagle Garage, 12-14 Glasthule Road, Sandycove, Co. Dublin, Ireland.

LIZIERI, STANTON ADAM (F M) technologist, Brico (Australia) Pty., Ltd., 47-57 Mallett St., Camperdown, Sydney, N.S.W., Australia.

MAFFEI, FRANCISCO J. (F M) chief chemist, Instituto de Pesquisas Technologicas, Do Estado de Sao Paulo, Brazil, South America. (mail) Caixa Postal 2843.

PETTERSSON, ERIC GUSTAV ANSLEM (A) mechanical engineer, Ford Motor Co., A. B. Frihamnen, Stockholm, Sweden (mail) c/o Lindstein, Roslagsgatan 37, 4 tr.

Applications Received

The applications for membership received between March 15, 1940, and April 15, 1940, are listed herewith. The members of the Society are urged to send any pertinent information with regard to those listed which the Council should have for consideration prior to their election. It is requested that such communications from members be sent promptly.

Baltimore Section

SCHRADER, ALAN RICHARD, assistant mechanical engineer (Diesel), U. S. Navy, U. S. Naval Engineering Experiment Station, Annapolis, Md.

Canadian Section

CONNER, GORDON MYRON, lubrication engineer, Canadian Oil Companies, Ltd., Montreal, Quebec.

WARGIN, LEO ALEXANDER, president, Acme Bearings & Parts, Ltd., Toronto, Ont.

Cleveland Section

ENDRESS, CLARENCE H., electrical engineer, Willard Storage Battery Co., Cleveland.

FAHLMAN, EVERETT G., president and general manager, The Permold Co., Cleveland.

NORDBERG, CARL F., executive, Willard Storage Battery Co., Cleveland.

ROCKWOOD, PHILIP B., engineer, Cleveland Railway Co., Cleveland.

Detroit Section

SCHOU, CARL E., engineer, The Auto-Drive Corp., Gothenburg, Sweden (mail) Book-Cadillac Hotel, Detroit.

THOMPSON, HARRIS A., engineer, Holley Carburetor Co., Detroit.

Indiana Section

NEWMAN, PERCY ALEXANDER, tool engineer, Ross Gear & Tool Co., Lafayette, Ind.

Metropolitan Section

BLOOD, WILLIAM EVANS, president, Aero Spark Plug Co., Inc., New York.

BRICE, PHILIP EDGAR ROWLAND, engineer, Republic Aviation Corp., Farmingdale, L. I., N. Y.

BROWN, PERRY W., general superintendent, Wright Aeronautical Corp., Paterson, N. J.

CAMP, THOMAS L., head, Mechanical Test Department, Permatex Co., Inc., Sheepshead Bay, New York.

CLAPPER, HOMER W., test engineer, Wright Aeronautical Corp., Paterson, N. J.

CURREN, ARTHUR THOMAS, test engineer, Wright Aeronautical Corp., Paterson, N. J.

ENO, DONALD W., junior experimental test engineer, Wright Aeronautical Corp., Paterson, N. J.

HEATON, EDWARD FRANCIS, test engineer, Wright Aeronautical Corp., Paterson, N. J.

HEINIG, FRED C., test engineer, Wright Aeronautical Corp., Paterson, N. J.

HUFF, JOHN N., metallurgist, Curtiss Propeller Division, Curtiss-Wright Corp., Clifton, N. J.

HUNTER, DAVID ULRICH, senior stress analyst, Wright Aeronautical Corp., Paterson. N. J.

JAROS, ZYGMUNT, experimental tester, Wright Aeronautical Corp., Paterson, N. J.

LORD, ROGER, vice-president, The Trucktor Corp., Newark, N. J.

LOSSON, WESLEY L., license division engineer, Wright Aeronautical Corp., Paterson, N. J.

MATHEY, AUSTIN V., test engineer, Wright Aeronautical Corp., Paterson, N. J.

MCLOUGHLIN, FREDERICK P., machinist, Intertype Corp., Brooklyn, N. Y.

MODROVSKY, JOSEPH, stress analyst, Wright Aeronautical Corp., Paterson, N. J.

ORENSTEIN, STANLEY A., electrical engineer, United Transformer Corp., New York.

SCOTT, WINTHROP GLOVER, test engineer, Wright Aeronautical Corp., Paterson, N. J.

SETTERBLADE, EARL OLIVER, senior test engineer, Wright Aeronautical Corp., Paterson, N. J.

THOMPSON, FREDERICK W., test engineer, Wright Aeronautical Corp., Paterson, N. J.

VAIDEN, JOHN C., test engineer, Wright Aeronautical Corp., Paterson, N. J.

WARE, JOSEPH F., JR., test engineer, Wright Aeronautical Corp., Paterson, N. J.

WARRENDER, LEE D., vice-president, Casey Jones School of Aeronautics, Newark, N. J.

ZAHODIAKIN, VICTOR F., president, Z-Flex Piston Ring Corp., New York.

ZIMMER, AARON S., production research engineer, Hygrade Products Co., Inc., Long Island City, N. Y.

Milwaukee Section

BALL, CHARLES F., chief engineer, Chain Belt Co., Milwaukee.

BOLL, FRED J., research engineer, Globe-Union Inc., Milwaukee.

PERFEX CORP., Milwaukee.

SCHROEDER, JOSEPH H., assistant to chief engineer, Barlow & Sellig Mfg. Co., Ripon, Wis.

New England Section

MEGRATH, GEORGE WILLIAM, student, Franklin Union Technical Institute, Boston.

WEBBER, DAVID STUBBS, student, Franklin Union Technical Institute, Boston.

Northern California Section

MARTINELLI, RAYMOND CONSTANTINE, instructor, University of California, Berkeley, Calif.

Northwest Section

KETCHUM, LEE, sales engineer Six Robblees, Inc., Seattle, Wash.

Philadelphia Section

MAY, WALTER M., engineer, Mack Mfg. Corp., Allentown, Pa.

Pittsburgh Section

JONES, WILLIAM O., manager, Bendix Westinghouse Brake Station, Pittsburgh.

SAXMAN, ALBERT BYRON, A. R. Platt, Pittsburgh.

Southern California Section

BOMER, EDGAR T., draftsman, Lockheed Aircraft Corp., Burbank, Calif.

DEAN, DUFF L., western representative, Lord Mfg. Co., Burbank, Calif.

DONOVAN, ROBERT C., designer, Douglas Aircraft Co., Inc., El Segundo, Calif.

FITZGERALD, JOHN ARNOLD, draftsman, Douglas Aircraft Corp., Santa Monica, Calif.

ROGERS, R. MAX, chief engineer, Jadson Motor Products Co., Division, Thompson Products, Inc., Bell, Calif.

TOWNSEND, JOHN M., checker, Engineering Department, North American Aviation, Inc., Inglewood, Calif.

Southern New England Section

BISCHOFF, WALDEMAR OTTO, checker, Engineering Department, Pratt & Whitney Aircraft, Division United Aircraft Corp., East Hartford, Conn.

NYSTROM, CARL HARRY, designer, American Bosch Corp., Springfield, Mass.

Syracuse Section

KENERSON, CHARLES J., vice-president, general manager, treasurer, Morse Chain Co., Division Borg-Warner Corp., Ithaca, N. Y.

Washington Section

GRAY, JACK T., chief, Aircraft Airworthiness, Civil Aeronautics Authority, Washington, D. C.

Outside of Section Territory

CLUFF, HARRY MONROE, automotive service engineer, National Carbon Co., Inc., Raleigh, N. C.

FRIDERICI, WAYNE J., chief engineer, The Standard Products Co., Port Clinton, Ohio.

GRAHAM, R. C. L., Lt.-Col., U. S. Army, Fort Sam Houston, Texas.

JENKINS, AB, Mayor, City of Salt Lake City, Salt Lake City, Utah.

LINES, A. W., president, The Accuralite Co., Muskegon, Mich.

SNYDER, LEO ANDREW, vice-president, sales, Champlin Refining Co., Enid, Okla.

Foreign

DYKES, CHRISTOPHER, assistant to research engineer, British Overseas Airways Corp., London, England.

HALL, ROBERT ARNOLD, research engineer, British Overseas Airways Corp., London, England.

HOFMAN, ERIK, technical supervisor, International Aviation Associates, London, England.

RÉMONT, MARCEL, trade engineer, Etablissements M. Rémont, Brussels, Belgium.

ST. HILAIRE, FRANK DESMOND, senior refinery operator, Trinidad Leaseholds Ltd., Pointe-a-Pierre, Trinidad, B. W. I.

SUTCLIFFE, JOHN WHATELY, technical assistant to superintendent home engineering, British Imperial Airways Ltd., Bristol, England.

TRAUTTEUR, DR. ING. AMEDEO, manager, Compagnia Italiana, Westinghouse, Torino, Italy.

See pp. 42-43

News of the Society

(*Continued from page 16*)

always starts in first gear, shifting smoothly and silently to second, third and fourth as car speed increases.

The transmission consists of two planetary units for the four forward speeds and a third planetary unit which combines with the other two to give reverse. Changing from one gear to another is controlled by a centrifugal governor which is influenced by throttle position through the valve box. Shifting is jointly controlled by governor and accelerator pedal.

There are two geared oil pumps, one at front driven from the engine, and a rear one driven by the tailshaft. The front pump which develops 30 lb per sq in. pressure is used for starting. As the rear pump increases in speed its oil discharge assists the front pump. When the tailshaft reaches 1500 rpm, the rear pump develops 80 lb per sq in. pressure and thereafter supplies pressure for gear shifting.

A special oil employed in the Hydra-Matic transmission system was developed by oil producers under the direction of the Olds Works. It is an oil designed to withstand excessive heat and contains an inhibitor to prevent varnish formation.

Road tests in starting and stopping on steep grades have shown the efficiency of the Hydra-Matic transmission, the speaker said, citing tests on 32% grades in San Francisco. In such continuous tests, oil temperatures continued safe whereas water temperatures were over 300 F.

Youngren Speaks at Toronto

Many Toronto residents will remember March 20 as the date of one of the worst snow storms of the year, but to 115 members and guests of the Canadian Section it also marks the date that H. T. Youngren, chief engineer of Oldsmobile, gave them first-hand information on the Hydra-Matic transmission. Mr. Youngren used many slides to illustrate his paper and, during the discussion period, answered a number of questions from the floor.

Guest of the Section was E. F. Lowe, SAE assistant general manager, who said a few words on current activities of the Society and advantages of membership.

Section Chairman M. L. Brown presided and Col. F. W. Miller, regional vice-chairman of the Section and general manager of Collins & Aikman of Canada, Ltd., was host of the evening.

Speaker Youngren was honored at a luncheon given by R. W. Richards, chairman of the Section's meetings committee, at which a number of the officers and past-officers of the Section were present.

Weaver Cites Research Aim as Customer-Manufacturer Harmony

● **Detroit**

HARMONY between manufacturers and customers – an outstanding objective of customer research – is attainable, either directly or by compromise, if the facts relating to customer psychology are known and applied constructively, according to Henry G. (Buck) Weaver, speaker at the March 18 meeting of the Detroit Section. The speaker used the accompanying chart as the theme of a talk which touched briefly but effectively on many phases of automotive engineering and merchandising.

Mr. Weaver, who is head of the Customer Research Division, General Motors Corp., said that the attainment of harmony between manufacturers and customers lies in moving the two lines on the chart together to form one line. Obviously this could be done by changing conditions in either column on the chart, but in many cases must be done by modifications made on both products *and* taste, and on policies *and* desires. In changing the product, physical laws are involved, whereas an attempt to change the thinking of the consumer involves study and application of psychological laws. Customer research, he said, is a study of what the customer wants, or thinks he wants, in automotive design, and how the customer wants it "served up."

HARMONY

Manufacturers' →	← Customers'
Products and →	← Tastes and
Policies →	← Desires

The science of customer research, he added, is founded on the conviction that the psychological problems are just as subject to scientific attack as are the physical problems.

Availability of facts relating to engineering, manufacturing *and* consumer psychology help to determine how the goal of harmony can be attained. Sometimes, Mr. Weaver said, customer suggestions on design and expressions of taste can be accepted directly, but whether they are depends upon (1) engineering soundness (2) the boundary lines of public acceptance and (3) consideration of cost, including the cost of popularizing new features with the consuming public.

Quoting a facetious appraisal of customer research, written by a motorist returning a GM questionnaire, Mr. Weaver read, "At least it may keep the engineers from making the same mistakes over and over again, when there are so many new mistakes that they could be making." He added that constant probing of public opinion and taste in connection with automotive design has, at least, a "nuisance value" in that it serves as an antidote for the dangers of complacency.

Referring to experiences with automotive questionnaires, he said that the customer is not a specialist and does not think like one. On a questionnaire about radiators, for instance, there may be replies or comments dealing with financing, service, or some other phase of the customer's experience in buying and using automobiles – an indication of the wide field encompassed by customer taste and opinion.

In the analysis of replies to questionnaires, the time element is important, he declared. Thus the objection to rear compartment tunnels for drive shafts may be doubled in summer time when the nearly vertical walls of the tunnel soil white shoes, for instance. Further, the customers' interest in particular features does not necessarily parallel the interest of engineers and manufacturers. At a time when lifting jacks received very little attention from manufacturers or engineers, public criticism of jacks reached a peak, he indicated.

A motorist's answer to a questionnaire, he revealed, started investigation which revealed four years ago that many instruction books provided with new cars still gave extended instructions on how to store automobiles in winter. Seventeen out of twenty-seven instruction booklets then devoted space to this subject, a check-up showed.

Mr. Weaver concluded with the assertion that the engineer should remember that he has a stake in selling. The engineer concerns him-

Weaver Airs Views On Specialization

VIGOROUSLY Mr. Weaver assailed extreme specialization. With all of its tremendous advantages, he told Detroit members, it brings with it the danger of narrow-mindedness and lack of coordination. Thus there have risen groups which consider product all-important and other groups which consider sales efforts all-important, and a condition exists in which specialists tend to work at cross purposes. It was suggested that we need more "specialists in generalities."

Customer research is not a specialized function, Mr. Weaver declared, but must go in the "twilight zone" between the responsibilities of various specialists. There are many things, he said, in the "twilight zone" which need doing but which are left undone because they do not fall in the bailiwick of any one specialized function.

Mr. Weaver paid tribute to the specialization without which mass production would be impossible, but pointed out that the successful business leaders today are men who got their training before business had grown so big – under conditions where it was possible for them to observe the interrelation of the various functions at close range. In an age of extreme specialization, "I don't know where we will get future leaders," Mr. Weaver insisted.

self most with the proper interpretation of the fruits of his genius. This is particularly true with regard to the more intricate aspects of design. The engineer is in one of the two important groups of doers in the world – the one which includes the investigators and creators, Mr. Weaver said. The other group, he declared, consists of interpreters – and Mr. Weaver advocates greater efficiency in interpreting or translating the ideas and facts of the creators and investigators into language understandable by the man on the street.

Coffee speaker after the dinner was Dr. K. T. Gruber, medical and general superintendent, Eloise Hospital & Infirmary, who brought up to date the history of the medical treatment of mental diseases, with explanations and descriptions of the modern methods of treatment. He discussed briefly the various types of insanity and the cures, including occupational therapy, music therapy, recreational therapy and the use of insulin, malaria, and other so-called "shock treatments" which result in complete cures for a large percentage of mental cases.

University of Colorado Host to SAE Members

● **Denver Club**

The University of Colorado was the site of the SAE Club of Denver's April 2 meeting, when the group was the guest of the ASME Student Branch at the College. Following a welcome by the Student Branch chairman and a talk by A. J. Scaife, consultant, Dean Gillespie & Co., on the SAE and opportunities for mechanical engineers in the automotive industry, the group was conducted through the University's laboratories. Members of the automotive, aviation, steam, and chemical engineering faculties served as guides.

Predicts Reduction In Gear-Tooth Sizes

● **Milwaukee**

Closing technical feature of the three-day Wisconsin Engineering Conference, Milwaukee, March 13-15, was an open meeting of the SAE Milwaukee Section. R. S. Drummond, president, National Broach & Machine Co., was the speaker, and his subject: "Modern Methods of Gear Manufacturing." More than 300 attended.

Mr. Drummond's prediction of a sharp reduction in gear-tooth sizes, even so far as halving the size of the tooth and also reducing some of the present pitch diameters, was received with particular interest. Without doubt, he said, this trend is attributable to the higher accuracy of modern gear-making machinery which permits the use of a gear much wider in proportion to its tooth size than was even thought of a few years ago. Finer pitches, he continued, result in less wear because of reduced rubbing or sliding action in the meshing of the teeth, and a reduced lever arm for breaking out the teeth when the load is carried on the outer point.

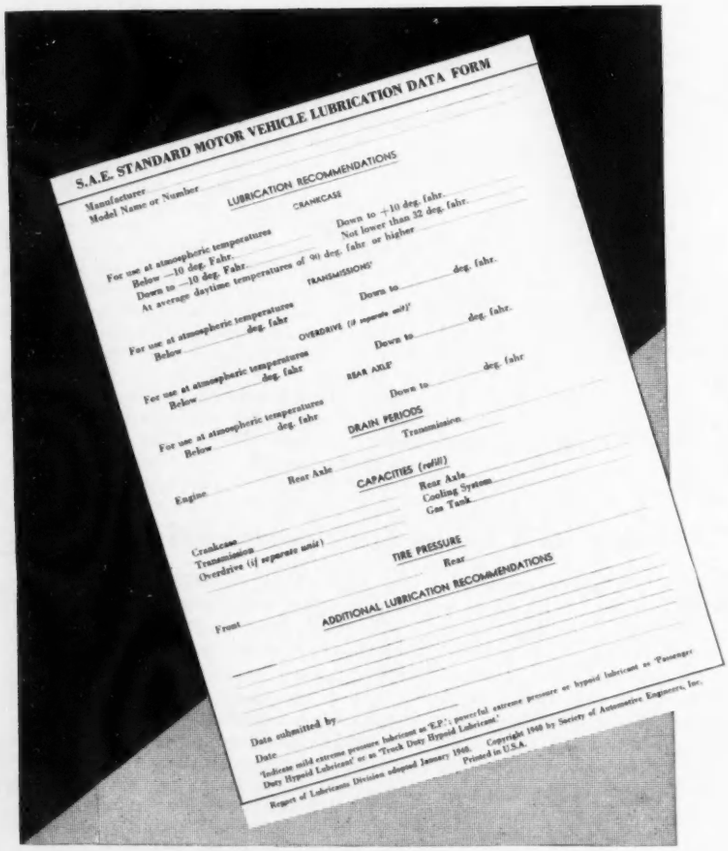
Another prediction made by Mr. Drummond was that we are going to get away from much of our present carburized and hardened gearings and go to some of the harder materials, up to say 30-C Rockwell, which could be shaved. All of us know, he said, that much of our gearing trouble is caused by distortion of the material in the furnaces, and that when this occurs even the most accurate cutting in the world will not help.

Heavy roughing cuts, the speaker explained, leaves the surface in a peened condition due to the hammer action of the cutter. This peened surface, he averred, will be full of internal strains which will relieve themselves in the furnaces. He emphasized that shaved gears show less distortion because of the different action of the cutter, which does not leave behind it the surface strains.

Symmetry and regular shape in the gear blank also was shown to be of considerable importance in holding the true shape – not only the tooth form, but the concentricity of the gear itself. It is Mr. Drummond's contention that an up-set forged blank, having a better grain flow, is less subject to distortion than bar stock.

Touching on the general shape of gearing, the speaker cited the history of spur gear development. For some unknown reason, he said, it was started at a 14½ deg pressure angle and later changed to the current standard of 20 deg. Present indications, he added, are that the spur gear will remain at about that point.

Helical gearing he said, has gone through the same pressure-angle development, and present trends indicate that the pressure angle will be dropped back to some point between the two present standards of 14½ and 20 deg. He noted that the helix angle has also been moved over an extremely wide range, with the present general average in the low thirties.



Prepared by a special subdivision of the Lubricants Division of the SAE Standards Committee: H. R. Wolf, Research Laboratories Division, General Motors Corp., chairman; W. E. Blaine, Chek-Chart Corp.; Joseph Geschelin, Chilton Co.; and B. E. Sibley, Continental Oil Co.

SAE DEVELOPS NEW STANDARD FORM FOR LUBRICATION DATA

UTILIZATION by car, truck, bus, and tractor manufacturers of the recently developed SAE Standard Motor Vehicle Lubrication Data Form will provide a simplified uniform record of their lubrication recommendations for use by engineers, fleet operators, lubricant suppliers, and parts manufacturers.

When filled in, each form is a master form from which copies can be made.

Available only from the SAE, these forms may be obtained at 10c each to non-members and 5c each to members. Minimum charge 25c. Quotation on quantity lots.

Send orders to: Society of Automotive Engineers, 29 West 39th Street, New York.

Suggests Why Few Bombs Fall in European War

● **Syracuse**

The vulnerability of bombers to pursuit planes, the effectiveness of anti-aircraft batteries, the difficulties of accurately bombing a target that must be sighted some miles away, and the lack of long-range fighter planes to convoy bombers to their objective, are among the reasons why there has been no widespread bombing in the present war, according to A. T. Colwell, vice-president, Thompson Products, Inc. In his paper, "War Wings," presented at the Syracuse Section's March 25 meeting, Mr. Colwell declared, "This war will probably develop long-range fighters for bomber convoy, and there may be no extensive raids against adequate defense until this is done."

More speed and heavier armament are the qualities sought in new military plane design, he told his Syracuse listeners, adding that American design is quickly anticipating these demands. He reported that "more machine guns per pursuit plane, with cannon added are being used in this war. Some bombers are carrying light armor, and cannon are more effective against them. The ammunition supply of each pursuit plane is limited to keep weight down, and this added weight becomes more of a problem with cannon. On escort, a pursuit plane that exhausts its ammunition in one engagement is useless thereafter. Further," he added, "the bombers are comparatively fast, and a pursuit plane leaving the formation for combat would probably not regain it."

Mr. Colwell paid particular tribute to the constant-speed propeller, an American invention, as the outstanding aircraft development of the past decade. Fast planes, he said, can climb 2500 to 4000 fpm with this propeller – and new designs will climb faster. Both sides in the war are using this type on their latest planes, he added.

Commenting on aircraft production of the warring nations, Mr. Colwell stated, "It is evidently true that Germany has outstripped the world in military aircraft production – and in the space of six years." He noted that their own data and speed records are not reliable, but that in 1938 German production probably equalled that of England, France, and the United States combined.

Germany's position became possible, he said, by following a "definitely planned but uneconomic system." He added that Germany was preparing for "a pre-determined war – not a possible war." Continuing, he stated, "In 1933 Germany had a few factories for the production of aircraft or aircraft engines. When war broke out she had approximately 70 plane factories and 35 engine factories. With no regard for economy," he reported, "great modern factories were built, with bomb-proof shelters, with buildings spaced to prevent bombings, and with guiding lines for blackouts."

He noted that in Spring of 1939 there was apparently no shortage of raw material in German plane and engine factories. Planes recently shot down in England, he reported, showed no signs of "ersatz" material; contrary to general opinion they were well built and of excellent quality.

Labeling the British and French apathy toward the tremendous rearmament program in Germany as "one of the historical enigmas of all time," Mr. Colwell stated, "Realization of the situation dawned at Munich, and a lackadaisical rearmament policy was transformed into a mad scramble for machine tools, parts, specialists, skilled labor, and factories, in a real bid for aircraft production." England and France are gaining rapidly on Germany, he stated, adding that probably by the first of the year they will be near equal terms. Good planes bought in the United States, he averred, are helping to fill the gap in the meantime.

"America is producing the finest quality aircraft motors and planes in the world today," Mr. Colwell told his audience. American engines have the enviable reputation of the longest operation and greatest dependability in the world, he said, adding that reports from France are now coming in – and they check this. The engines are operating over 300 hr without attention – longer than any European motor made. "In the last war," Mr. Colwell recalled, "it was necessary to continually work on the motors between flights – the present American motors stand in zero weather, start readily when warmed, operate cleanly without throwing oil, and their dependability has served to build high morale in the French air force."

"The war is accelerating American development," Mr. Colwell declared. "The Bell Airacobra is a fighter of new design, honest speed over 400 mph, great maneuverability, and flying range 1000 miles. The Lockheed P-38 fighter flies over 400 mph and is very well armed. The Curtiss P-40 has exceptional characteristics for a fighter, and these are exceeded by the P-46, which is some 25% better than the P-40 – it is not yet in production. Consolidated has developed the new long-range bomber, 3000 miles at 300 mph, and has a more formidable one under way. Douglas, Boeing, Vultee, Martin, Brewster, Grumman, Northrop, Seversky, and Vought-Sikorsky are all working on advanced plane designs. Allison, Pratt & Whitney Aircraft, and Wright Aeronautical are advancing motor designs.

"There is no lack of aircraft or engine design

talent in America," he maintained, declaring, "the Government should at once finance additional plane and engine research work – this can be done by a democracy as well as by a totalitarian state."

Standard Tests Being Developed for Plastics

● Cleveland

Particular attention must be paid to the physical testing of plastics for specific applications such as exist in the automotive industry, T. S. Carswell, director of research, plastics division, Monsanto Chemical Co., told members of the Cleveland Section, March 11. "Up to the present time," he said, "physical testing has been largely empirical, and separate tests have been devised for each specific use. The American Society for Testing Materials is today very active in developing standard test methods, and it is hoped that at least part of the empirical methods will be supplanted by more rational tests."

In this connection, he added, considerable attention is being paid to the stress-strain diagram for plastics. He stated, "In considering the stress-strain diagram attention must be given to the fact that in dealing with plastics we have a condition similar to that which would exist if we were testing metals at approximately a red heat. That is, the flow points of plastics usually lie not over 100 C from room temperature. Consequently, plastics exhibit such properties as cold flow which are not exhibited with metals far below their melting points."

Synthetic organic plastics date from 1868, originating with the invention of the camphor-nitrocellulose mixture commonly known as celluloid, Mr. Carswell stated. He described the plastics in commercial use in approximately their order of development. He spoke of nitrocellulose as "one of the cheapest and toughest plastics known, although it does lack stability and color-fastness as compared with some of the newer plastics." It was employed as the plastic in the earliest safety glass.

Phenol-aldehyde resins, he said, were commercialized as a result of Baekeland's work about 1909, and today form one of the largest branches of the plastics industry. Molded phenolics, he explained, have a variety of automotive uses, particularly in electrical parts such as distributors. Cast phenolics, he noted, have been employed for some decorative uses and offer considerable promise because of their brilliance of color.

Mr. Carswell paid tribute to cellulose acetate for its virtue of being very resistant to shock, excellent in light-fastness, and capable of production in delicate colors. It is not as resistant to water as would be desirable and its toughness tends to change rapidly with temperature, he added. It is being widely used for decorative purposes in automobile parts. One of its most important uses has been in the production of safety glass.

The urea formaldehyde resins are used mostly for molding purposes. They have the advantage of being light-fast and can be produced in delicate shades, the author stated. Of cellulose ethers he said that methyl-cellulose is water soluble with little applicability in the usual plastic fields. Ethyl cellulose has some excellent characteristics, he noted, and will no doubt find a considerable field of usefulness.

Regarding vinyl esters, the speaker stated that polyvinyl acetate has some uses as a resin, particularly in the adhesive field, but that its properties change too rapidly with temperature to make it very useful as a plastic per se. Vinyl chloride, he declared, is finding many uses as a resin, particularly in the form of a wire coating when highly plasticized. The co-polymers of vinyl chloride and vinyl acetate, he pointed out, combine the desirable properties of both the chloride and the acetate and at the same time eliminate many of the disadvantages of the individual substances.

Resins produced by polymerization of acrylic and methacrylic esters are outstanding in clarity and have the interesting property of transmitting light in one direction, Mr. Carswell explained. They are being used for many decorative purposes.

The butylal derivative of vinyl acetal is finding wide application in the manufacture of high-test safety glass; virtually displacing the nitrate and acetate plastics, particularly because it has much higher impact strength at low temperatures, according to the speaker. He averred that the polyvinyl butylal resin, when plasticized, shows unusually good impact resistance. The other resin in the vinyl acetal classification is obtained by condensation of formaldehyde with polyvinyl alcohol, and is known as Formvar. When properly combined with phenol-aldehyde resins it is finding wide application in the production of coating for magnetic wire; superior to the old enamel coating in point of solvent resistance, adhesion to wire, electrical properties, and resistance to bending.

Polystyrene was the last plastic described by Mr. Carswell. Although it has been known for more than 100 years, he said, its commercial application in the United States only has been developed within the last two or three years. Styrene is customarily employed for injection molding and can be produced in crystal or light pastel shades. It is finding increasing use for molding, and as further experience with molding technique is achieved, he revealed, increasingly complicated parts are being manufactured. Polystyrene is outstanding in electrical resistance because it is a pure hydrocarbon and has extremely low water-susceptibility, he explained.

Traces Steps in Solving Oil Oxidation Problems

● Philadelphia

The internal-combustion engine was called "an excellent device for oxidizing oil" by J. R. Sabina in his talk before the Philadelphia Section and its guests on March 13. He emphasized, however, that its complexities make simple reproduction of oil oxidation in laboratory devices extremely difficult, and that study of the course of oxidation and effects of addition agents on this change is still largely a matter of fitting together theory and bits of empirical information accumulated from laborious engine tests.

Mr. Sabina, who is manager, petroleum chemicals testing laboratory, E. I. du Pont de Nemours & Co., simply defined oxidation as the change which takes place in an oil by virtue of its reaction with oxygen. However, he added, there are modifying effects on the process of oxidation as it actually takes place within the engine itself, such as temperature, aeration, catalysts, other contaminants, polymerization and condensation products, to say nothing of variations in time-temperature relationships existing in the engine. Due to these variables, it was pointed out, the course or extent of oxidation is not uniform throughout the engine, hence corrective means for a particular combination of conditions does not necessarily mean that they will reduce effectively oxidation under other conditions.

That oxygen contributes markedly to oil breakdown and engine fouling; that a suitable addition agent, which reduces the oxygen effect, materially improves oil and engine conditions; and that the major portion of oil oxidation takes place in the crankcase; the top part of the engine playing a relatively unimportant part, were reported by Mr. Sabina as conclusions drawn from a number of laboratory tests correlated with research using a single-cylinder liquid-cooled Lauson engine.

When the problem of oil oxidation and oxidation control is approached from the angle of what can be done on the road, other variables enter the picture which make the achievement of a simple answer even more difficult, declared the speaker. Important variables in the field were listed as the nature of the oil, design of the engine, and operating conditions.

Regarding oils, he said that the response to addition agents will vary with each type of oil to the extent that it is necessary to evaluate carefully the base oil before attempting to specify the most suitable addition agent.

While engine design is not so important, if the diesel engine is eliminated, he continued, it is still a factor if the bearing materials are subject to corrosion, or if a particular engine design produces unusually high crankcase-oil temperatures.

Mr. Sabina stressed the importance of operating conditions as an important factor, with temperature and time playing a major part. A point to be borne in mind, he said, is that differences exist between addition agents regarding what might be called the temperature-activity coefficient. Some materials require high temperatures before they become active and others are good low-temperature anti-oxidants, he explained.

The importance of regulating the drain period was shown by the speaker when he pointed out that the rate of oxidation accelerates rapidly after a period of relative inactivity. He stated that this also is true when addition agents are added to the oil – but that the period of inactivity usually is much longer.

In his general conclusions, Mr. Sabina pointed out: 1. Addition agents offer a useful method for controlling oxidation of motor oils, reducing engine deposits, and inhibiting alloy bearing corrosion; 2. The three principal procedures by which this may be accomplished are: the use of true anti-oxidants, metal deactivators, and sludge dispersants; 3. The degree of improvement obtained depends largely on the nature of the oil and the operating conditions; and 4. At present the effectiveness of correction is greater under severe operating conditions than under mild ones.

Joining local SAE members in discussion of Mr. Sabina's paper were a number of out-of-town visitors, including, Harry C. Mougey, technical director, and Ewald J. Wolff, engineer,

Research Laboratories Division, General Motors Corp., Detroit; Ervin N. Hatch, inspection engineer, Brooklyn Bus Co.; T. L. Holland, vice-president, Lubri-Zol Sales Co., Cleveland; and Clifford Larson, consulting engineer, Sinclair Refining Co., New York. Mr. Larson conducted the technical session of the meeting.

Advocates Time Basis For Motor-Oil Changes

● **New England**

Change motor oils on a time rather than mileage basis, C. J. Livingstone advocated in his paper before the New England Section Meeting, April 9. During the winter months, he said many people make comparatively little use of their cars. Mileage is low and, because of the cold weather, oil may not flow freely enough to remove deposits in the engine. If oil is changed on a mileage basis, he continued, it may not be changed during the entire winter, with the result that the deposits will remain.

In the course of his paper, Mr. Livingstone reiterated many of the points made in his talk before the Pittsburgh Section at a meeting reported on page 58 of the February SAE Journal. He used a number of slides to illustrate important points, and amplified his talk in answers to pertinent questions asked during the discussion period. The speaker was introduced by Section Chairman Matthew A. Taylor.

Comprehensive Highway Development Plan Urged

● **Metropolitan**

Only a comprehensive highway development program can solve America's traffic congestion, can increase the market for domestic motor vehicle sales, and can be sold to the people of the nation, it was asserted at a symposium presented March 21 before the Metropolitan Section.

Speaking for Paul G. Hoffman, president of Studebaker Corp. and of the Automotive Safety Foundation, Dr. Miller McClintock, director of the Bureau for Street Traffic Research, Yale University, stressed Mr. Hoffman's philosophy of the "saturation point" of the American automobile market. It is not a question of economics, but of physics; sufficient good highways, scientifically planned to eliminate congestion and to permit motorists to enjoy driving, the speaker said, quoting Mr. Hoffman.

The symposium, "Rebuilding Our Cities for Traffic Safety and Efficiency," was directed by Dr. McClintock and participated in by Alexander Fraser, president, Shell Oil Co., Inc., St. Louis; Charles Goodrich, chief engineer of the American Bridge Co., Pittsburgh, who designed the new San Francisco-Oakland Bay Bridge; Frank Sheets, president of the Portland Cement Association, Chicago; and Mr. Hoffman, who was represented by Dr. McClintock. T. C. Smith, of the American Telephone & Telegraph Co., who is chairman of the Society's Highways Research Committee, presided. More than 350 members and guests attended and 265 were present for the dinner. A "March of Time" film preceded the speaking.

Development of a nation-wide program to build highways where most needed, to improve existing highways, and to improve traffic conditions of our large cities with wider streets and elevated highways, the symposium agreed, is well within the realm of possibility.

Such a program could be paid for without recourse to new taxes, by ending gasoline-tax diversion, and is the only sort of plan which would be approved by city and rural populations, speakers said.

Much of the money spent on piece-meal highway projects was declared wasted, because of the lack of any nation-wide plan. A decade ago such a comprehensive plan would be impossible, but the wealth of highway research now available, both from the standpoint of safety and economic use of roads, would be a source of valuable data.

The studies of universities and numerous foundations are all available, but need to be developed into an overall picture to present to the public and legislatures, it was averred.

"The great bulk of motor highway mileage and, with a few exceptions, all of our city streets were designed for the horse-and-buggy days. A few through highways have been built, a few streets have been widened, and a few miles of elevated structure have been constructed to meet the most pressing traffic congestion problems," Dr. McClintock said.

"Up to now," he continued, "a great deal of emphasis has been put on highway safety in developing sentiment for better highways. The economic use of streets and highways, however, is the problem that faces the automotive, refining, and the host of manufacturing industries which depend on improved highways for their future development and continued profit."

Several speakers pointed out that billions of dollars every year are spent on wages and materials of all industries interested in the use and construction of highways. Business men would welcome a comprehensive highway program, because most businesses and industries depend upon highway transportation directly or indirectly.

The mass of the American population would approve of a sound plan, but it is impossible to get the urbanite and rural taxpayer to agree on piece-meal schemes to eliminate specific conges-

tion troubles. The city dweller is not interested in the problem of the farmer, and the farmer thinks the "city slicker" is rolling in clover, anyway, Mr. Sheets said. "As a result," he added, "we see a large number of unrelated construction problems, some supported by the cities and others supported by the farmers." He predicted that the city dweller and farmer would "pull together" if they had a comprehensive, overall plan. "Then," he said, "we would see the sudden end of gasoline diversion."

The huge stake in better highway facilities was stressed by Mr. Fraser, who pointed out that more than a million people now are employed in the petroleum industry; that 25,500,000,000 gal of gasoline were sold to the motoring public and transportation companies last year; and that $1,300,000,000 were paid by the industry for taxes in 1939.

"We all have an obligation, as decent citizens, to do all we can to make highways safe, but industry in general has a huge stake in better highways," he concluded.

Links Bearing Woes to High Oil Temperatures

● No. California

Denouncing the evils of high-temperature operation, R. A. Watson, Federal-Mogul Corp., gave Northern California SAE members and guests considerable data on "Oil Cooling and Its Relation to Bearing Life," in his talk at the Section's April 9 meeting.

He told of investigations made in the field which revealed that in motor-vehicle operation maximum bearing temperatures of sufficient magnitude are reached to cause a serious loss in tensile strength of bearing metal. Further, he said, laboratory investigation has revealed that the factor having the greatest effect on bearing temperature is the lubricating-oil temperature, and that through its control bearing temperatures could be reduced.

It is the general opinion of authorities on automotive-engine bearing design and lubrication, he stated, that the ideal crankcase lubricating-oil temperature is about 180 F. With the lubricating oil maintained at this temperature, he asserted, the tensile strength of the bearing metal is from 20% to 40% greater than that obtained under severe trucking operations, and he added, bearing life should be at least 20% to 40% greater, with an improvement of several fold in some cases not unreasonable when viewed in the light of the short bearing life in hot weather.

Several methods of cooling lubricating oil were studied, he reported, with the conclusion that the best method of cooling oil is by the radiators in the air blast, while heat exchangers utilizing the engine cooling water are not practical for engines where oil control to 180 F maximum is desired. Similarly, he said, it is not feasible to jacket the oil pan or to employ cooling water coils in the oil pan.

Continuing his paper, Mr. Watson told how the studies shed light on why temperatures affect bearing life; what actual bearing temperatures are in service; what factors cause high oil and bearing temperatures to be generated; and how to reduce these temperatures most conveniently and effectively.

Section Chairman U. A. Patchett conducted the meeting and at the close of Mr. Watson's paper called on A. G. Marshall, Shell Oil Co., Inc., to start the discussion. Mr. Marshall's comment was that, unfortunately, engine bearings often fall into the category of those things which are not appreciated until they are lost.

Answering a question put by S. B. Shaw, Pacific Gas & Electric Co., as to the proper low temperature limit for oil, Mr. Watson set it within the range of 140 F and 160 F. G. L. Neely, Standard Oil Co. of Calif., remarked that he would be happier if the low limit were set at 160 F, and warned against going too low on account of water vapor condensation.

Mr. Neely then inquired regarding the relative life of a plain, ungrooved bearing as compared with a bearing of equal area but with a center circumferential groove. Mr. Watson's answer was that the latter bearing undoubtedly would be longer in life by reason of the better oil supply it would receive. In answer to another of Mr. Neely's questions, the speaker stated that silver bearings that were first lead plated and then indium plated, have been giving a good account of themselves from a corrosion standpoint. Asked by Mr. Neely about metal used for camshaft, wrist pin, and other auxiliary bearings, Mr. Watson spoke of successful wrist-pin bearing installations using bronze well serrated, or grooved, to insure lubricant distribution under adverse conditions and to prevent the dragging over of the bearing metal from one section to another.

J. A. Edgar, Shell Oil Co., Inc., entered the discussion to point out that, while considerable emphasis has been laid on keeping the bottom of the engine cool in the interest of long bearing life, there is the very definite problem of keeping the top of overhead valve engines hot enough. The valve cover, he asserted, serves as an excellent condenser, and with the dew point of crankcase vapor being in the neighborhood of 140-160 F, the top of the engine, which is exposed directly to the fan air blast, should be kept hot enough to avoid undue condensation.

Mr. Shaw re-entered the discussion to ask what might be new in the way of bearing development. Mr. Watson, in response, mentioned the aluminum bearing and the necessity of restricting its use to very hard shafts. He also spoke of a bearing high in lead content which is several hundred pounds stronger than babbitt in load-carrying ability. He commented that in his opinion the good performance of the so-called tri-metal bearing came more by reason of its very thin babbitt layer than by reason of the mere combination of three metals.

Peter Glade, Purity Stores, commended the author on the practical aspects of his paper, and emphasized the need of using tension wrenches to avoid unnecessary distortion and over-stressing in setting up bearing and other bolts in a diesel engine.

'Missing Link' Held to Slow Diesel Development

● U. of Wisconsin

There is a "missing link" in diesel development, members of the University of Wisconsin Student Branch heard March 7, when addressed by O. D. Treiber, chief engineer, diesel division, Hercules Motors Corp. With its discovery, he predicted, the gasoline engine will disappear.

This "missing link," Mr. Treiber declared, is a method to ignite the mixture with a compression ratio of 10 or 11:1. In his opinion the electric spark is not the answer to this

Activity Name Shortened

"Tractor & Industrial Activity" is the new name of the "Tractor & Industrial Power Equipment Activity." Final action in briefing the former activity title was taken by the Council at its March 28 meeting.

This activity, which is headed by SAE Vice-President J. M. Davies, Caterpillar Tractor Co., is laying plans for a National Tractor Meeting to be held in Milwaukee early next Fall.

problem because the potential would have to be very high and the spark-gap accordingly small. The mixture of fuel and air, he continued, is hard to control. Catalysts have been suggested as an answer to this problem, but, he said, they are good only for a short period of time.

Before mentioning the "missing link," Mr. Treiber explained that the compression ratio of most diesel engines is 16:1. Sometimes temperature goes up to the limiting value which means that the fuel is burning when the piston is going down, decreasing the efficiency of the engine. The most efficient ratio, he stated, is 10 or 11:1, but because engines with this ratio are hard to start on cold days, the compression ratio is usually higher to compensate for this, although some of the engine efficiency is lost by the change.

Mr. Treiber told the students of experiments with different types of combustion chambers which have shown that the fuel should be sprayed into turbulent air in the cylinder. The combustion chamber must keep the fuel from the walls of the cylinder until combustion is complete, he explained. This is accomplished, he said, by spraying the fuel into a sphere at the head of the cylinder so that drops of liquid will not get into the cylinder. This, he added, also slows up the rate of burning. Too rapid burning causes an excessive rise of pressure in the cylinder and detonation. He noted, further, that the speed of revolution of the air in the sphere is 50 times crankshaft speed and that the air makes only two revolutions in the sphere during the fuel injection. There is an ignition lag of 0.008 sec after the fuel injection which gives time to convert the fuel from a liquid to a vapor.

In explaining why the automotive demand for diesels is not great enough to bring them into a competitive price-range with gasoline engines, Mr. Treiber averred that at present prices trucks must run 50,000 miles per year to show greater economy with diesel engines. He also noted that the present diesel is not a demon for getaway, vibrates, and is lacking in other features that would make it desirable as a passenger-car powerplant.

Visions Soluble Dishes To Eliminate Washing

● So. New England

If the development of plastics and their uses continues at the present rate, H. S. Spencer, Durez Plastics & Chemicals, Inc., prophesied in his talk before the Southern New England Section, April 3, it is conceivable that walls, floors, ceilings, and furniture of our homes may be of plastics, to say nothing of rugs, upholstery, and draperies made of synthetic materials. He even indicated that it may be possible to clean the house and its furnishings with a hose, absorbing the moisture with a hot-air blast. Dishes, he visioned, may be produced at such a low cost that it would be more economical to dispense with washing them and merely dissolve the dishes in a tank and let the solution run down the drain.

New types of plastic materials have been appearing at the rate of about one per year during the past decade—prior to 1929 one new type came to light every 20 years, according to statistics placed before the Section by Mr. Spencer. Each year, he added, there is more than one pound of plastic material bought for every man, woman, and child in the United States, and that totals to more than 160,000,000 lb.

Plastics had their birthday about 75 years ago, when John Wesley Hyatt developed cellulose nitrate as a plastic mass instead of as a solution, he stated, adding that the new material was first used to make billiard balls.

Mr. Spencer grouped the most widely used plastics under the headings of phenolics, ureas, cellulose-acetates, styrenes, and methacrylate materials, listing the trade-named plastics falling into each group.

Some of these plastics, he explained, are thermoplastic and others are thermosetting. He defined thermosetting materials as those which become hardened or "set" through the application of heat and pressure, and which are formed into their final shape in tool-steel dies. In this group are two outstanding types, he continued, the phenol-formaldehydes and the urea-formaldehydes. Thermoplastic materials are those which soften with heat and "set" on cooling. Of this type are cellulose-acetates and polystyrenes.

Commenting that the phenolics have the greatest number of uses, and stand first as structural material for industry, Mr. Spencer spoke particularly of this plastic. Phenolic molding powder, he said, is molded in steam-heated steel dies into objects of almost any shape or size. It can be fabricated entirely by machine, and mold finished; coming from the die complete with a rich satiny finish that is a part of the piece itself and cannot wear off. He noted that it requires fewer production operations than any structural material, cannot warp or chip, and is lighter than metal; having about half the weight of aluminum; 17% that of iron, and 15% that of copper. Further, he stated, it needs no insulation, no plating nor enameling, and is resistant to acids, fumes, and moisture. The tensile strength of phenolic material, he added, runs between 5,000 and 10,000 lb per sq in., and its specific gravity is 1.35.

An interesting commentary made by Mr. Spencer is that many of the materials from which plastics are made are themselves synthetic. He explained that phenol originally comes from coal tar, and formaldehydes from methanol, which in turn is derived from hard wood. Potatos and soy beans, he revealed, can be made into products of such widely different properties as glass and wool.

California Students Take Honors in Paper Contest

● **No. California**

Stanford University was the scene of the Northern California Section's annual student-paper-contest meeting, March 12. Presenting highly technical subjects were representatives of Stanford University, University of California, and Santa Clara University. C. J. Vogt, associate professor in mechanical engineering, University of California, was chairman, pinch-hitting for Prof. L. M. K. Boelter, of the same faculty, who could not attend because of illness.

Tied for first place were two California students, William Parrish and George T. Hays, who presented papers on "Internal-Combustion-Engine Bearing Loads" and "Spark Plug Performance," respectively. E. J. Cambou, of Santa Clara, was awarded second prize for his paper, "Applications of the Hydrodynamic Coupling in Automotive Power Transmissions," and third prize went to J. H. MacPherson, Stanford, for his study, "The Use of the Electric Field in the Study of Flame Propagation."

Centering his presentation around chart on which had been plotted the connecting-rod and wrist-pin bearing loads of a 5½ x 7 in. one-cylinder diesel engine, Mr. Parrish commented that while there are many methods of computing bearing loads, they all must result in a balancing of forces so that no major differences in the final solutions should exist. The curves which he showed covered several points in a wide range of speed for the engine in question, and demonstrated clearly the effect of both inertia and gas loads upon reciprocating and rotating parts. All curves were plotted through 720 deg of crankshaft rotation. Referring to them he laid emphasis on the lower bearing loads which are present in a 2-cycle engine as compared to a 4-cycle engine, and the effect of a higher bmep in the direction of lessening the inertia load on bearings. In the discussion which took place later, the question of strains on an aircraft engine in power dives versus free dives brought out the points which the speaker had emphasized.

Mr. Hays' remarks on spark plugs were based to a great extent on work he is doing with one of the major air lines. In his opening remarks he cited figures which clearly evidenced the high spark-plug mortality which obtains in the modern high-output aircraft engine. He stated that in some operations the cost of spark plugs exceeds the cost of lubrication and that they contribute to many unscheduled delays. He also noted that the ignition harness is even more troublesome than the spark plugs themselves.

Major air lines, Mr. Hays stated, are giving careful scrutiny to their methods of testing spark plugs so that these test conditions will much more accurately duplicate the engine conditions under which the spark plug actually works in service. Such matters as gap widths, electrode shape, electrode material, fuel to air ratio, turbulence, rate of applied voltage, polarity, electrode temperature, presence of moisture, and oil, all have very definite relations to spark-plug performance and the voltage necessary to insure a proper spark, according to Mr. Hays. The necessary voltage varies from 9000 to 10,500 depending upon the electrode material; aluminum being at the low end and tin at the high end of this scale, he stated. During the testing of spark plugs, the rate of voltage application, and whether voltages are derived from alternating-current transformers or from the magneto itself, has a marked effect on the spark. A change in polarity may result in a difference of as much as 4000 volts for a spark of equal intensity, Mr. Hays noted.

In the discussion which followed Mr. Hays' remarks, inquiry was made regarding the present status of mica versus ceramic spark-plug insulators and in response Mr. Hays pointed out the difficulty being encountered in securing an adequate supply of good mica insulation and the large amount of work which is being done to bring the porcelain type of spark plug back into the picture.

Mr. Cambou presented three diagrams to show the construction of hydrodynamic coupling and the efficiency and torque results which obtain when such couplings are used both independently and in conjunction with a mechanical transmission. In his initial remarks, he explained the principle by which such couplings work and how there must be some sacrifice of torque, as we have learned to know it in mechanical gear boxes, unless the coupling is built into or used in conjunction with some type of mechanical leverage. Quoting data from an English source, Mr. Cambou remarked that buses equipped with hydrodynamic couplings use from 3 to 6% more fuel than do mechanically driven buses, but that there is a marked reduction in the maintenance cost. Discussion subsequent to the paper confirmed these points.

Mr. MacPherson prefaced his paper on flame propagation by general remarks on the interest of his subject to the automotive industry in relation to proper burning of the fuel in the internal-combustion engine. He alluded to the great amount of work which had been done in the study of detonation and the lack of exact knowledge on the process of combustion within the engine cylinder.

Upon turning to his paper, Mr. MacPherson dwelt to some extent on the history of the study of flame propagation in the years before the close association of the problem with the automotive engine. Early in this work, he said, scientists had given attention to the possibility of the presence of free electrons permitting ions to move in the unburnt gas area, thus preparing it for combustion. To learn the soundness of their theories, many scientists had observed flame action within an electric field. While neither the early nor the present work has been entirely conclusive in nature, it has been demonstrated that electric fields of different potentials and polarities and frequencies do affect flame propagation. Mr. MacPherson presented a number of slides showing the flame distortion which resulted from the presence of the aforementioned electric fields. His work at Stanford University has not yet been concluded, and he holds hope that it will bring forth more definite findings on this matter than have heretofore been available.

Following the papers, the meeting was concluded to permit those present to inspect the mechanical shops and laboratories of Stanford University. The highlight of this inspection was the recently added gage laboratory of the University's Military Department. Here much interest was shown in the wide variety of precise measuring apparatus which have been assembled for commercial use and in the event of a military emergency.

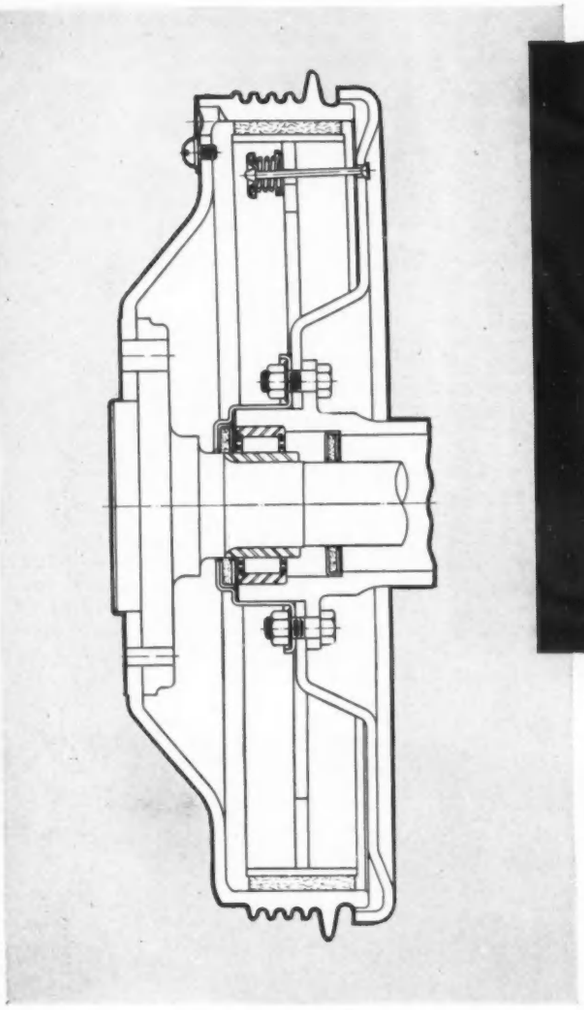
Credits Tetraethyl Lead For Upping Engine Power

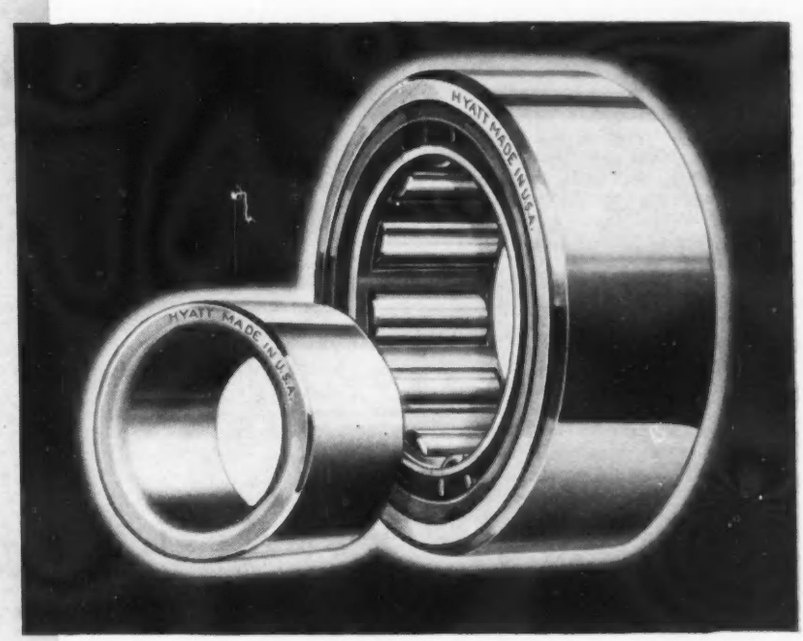
● **Oregon State**

The part that tetraethyl lead has paid in developing more power per weight in engines was explained, pictured, and demonstrated to members of the Student Branch at Oregon State College. Robert R. Mead, field engineer, Ethyl Gasoline Corp., conducted the meeting, showing motion pictures of the development of fuels for internal-combustion engines, giving a short explanatory talk, and with a special single-cylinder engine demonstrating knocking characteristics of different gasolines.

Mr. Mead explained compression ratios to the students and described how an increase in compression ratio betters the efficiency of an engine. He gave reasons for the trend toward higher-octane-number gasoline. In illustrating the importance of high-octane-number gasolines in making possible lighter motors of greater power, Mr. Mead told what was accomplished by changing from four motors using 85-octane gasoline to two motors using 100-octane gasoline, on the Philippine Clippers when originating the Transpacific flights. With the original motors it was found that on flights to Hawaii so much gasoline had to be carried that no payload could be taken on the trip. With the two motors using 100-octane fuel the same power

FOR Quiet-Mileage WHEELS





Hyatt Hy-Load Type Roller Bearing as applied to Passenger Car Rear Wheel illustrated above. Opposite is shown this bearing with the inner race separated.

In rear wheels the life of Hyatt Roller Bearings is long and quiet because Hyatts possess surplus capacity for unusual service conditions, accuracy and finish for quiet operation. Designed and built to prolong the life of the truck or car, Hyatts always perform quietly and efficiently, no matter what the application. Hyatt Bearings Division, General Motors Sales Corporation, Harrison, New Jersey, and Detroit, Michigan.

HYATT

ROLLER BEARINGS

QUIET

was produced and the Clippers could make the trip carrying 5000 lb of payload.

In demonstrating the quality of Ethyl gasoline in suppressing the knock in the motor, Mr. Mead used a single-cylinder gasoline engine equipped with two carburetors and two glass containers, each filled with a different gasoline which could be admitted to the motor at will. Gages recording the temperature and the revolutions per minute were projected on the screen.

The motor was started on regular gasoline and allowed to warm up to operating temperature and the corresponding rpm. Third-grade gasoline was then admitted and soon the engine started knocking with a rapid increase in temperature and quite a noticeable decrease in speed. Mr. Mead then demonstrated the difference between third-grade and Ethyl gasoline, and between regular gasoline and Ethyl. The effect of the Ethyl was very noticeable in increased speed at lower operating temperatures.

Student Branch Visits Steam Automobile Plant

● **M.I.T.**

Two business meetings and a visit to American Steam Automobile Co. in Newton, Mass., wound up a busy month of March for the SAE Student Branch at the Massachusetts Institute of Technology. They opened the month by attending as a group the New England Section meeting of March 7, which was addressed by SAE President Arthur Nutt.

On the April schedule was a trip to the Old Car Museum in Princeton, Mass., and participation in the MIT Open House. The Branch recently obtained a club room on the campus for its permanent use.

About Authors

(*Concluded from page 9*)

Dr. Kline continued his studies at George Washington University, which granted him his M.S. degree the following year. He received his Ph.D. from the University of Maryland in 1934. Before joining the National Bureau of Standards, Dr. Kline was research chemist at the Picatinny Arsenal, conducting investigations on high explosives and smokeless powders. Earlier he had been research chemist with the New York State Department of Health. He has contributed a number of articles to technical and scientific journals.

● **R. B. Mears** *was graduated from Penn State with a B.S. in Electrochemical Engineering in 1928. During the next four years he was employed at the Bell Telephone Laboratories in New York City. There, initially, he studied problems relating to the electrodeposition of metals and alloys, and later had charge of the corrosion testing section. In 1932, he went to England, where he studied the mechanism of metallic corrosion under the direction of Dr. U. R. Evans. Three years later he received his Ph.D. from Cambridge University. Shortly afterwards, he returned to the United States to work at the Aluminum Research Laboratories. At the present time he has charge of the corrosion group at these laboratories. Dr. Mears is the author or co-author of about 20 papers on the corrosion or protection of metals.*

● **Max Roensch** *(M '37) is a Texan. He was born in Giddings and received his B.S. degree from Rice Institute in 1926. The following year he attended the U. of Michigan. Leaving there with his M.S. degree, he immediately joined the Chrysler Corp., and started under J. B. Macauley who was in charge of dynamometer work and engine development. Mr. Roensch is now experimental engineer and assistant to Mr. Macauley in the Chrysler Highland Park dynamometer laboratory, developing engines for passenger-car, truck and marine use.*

● *"The human animal prefers to take chances with his property, his passengers, and his own skin, to staying in line behind a car or truck that cannot or will not move at a reasonable speed,"* said **Prof. J. Trueman Thompson** *of Johns Hopkins University, in his 1938 Annual Meeting paper published in the May SAE Journal of that year. He told of apparatus developed by the United States Bureau of Public Roads, for which he is highway research specialist, to check hill-climbing ability and practices. In his paper in this issue he reveals data obtained to date plus other information on highway-traffic flow. At Johns Hopkins Prof. Thompson is in charge of the civil engineering department. He joined the University's faculty in 1919, two years after his graduation from the same institution. In the interim he served in France with the U. S. Corps of Engineers and was employed by Black & Decker as experimental engineer.*